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Inpatient Pediatric Nurses' Knowledge, Attitudes, Beliefs, and Practices of Infant Safe Sleep

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Ph.D. in Nursing Program

Inpatient Pediatric Nurses' Knowledge, Attitudes, Beliefs, and Practices of Infant Safe Sleep

A Dissertation

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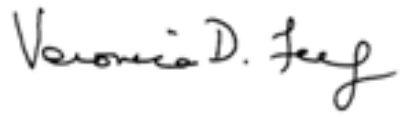
INPATIENT PEDIATRIC NURSES' KNOWLEDGE, ATTITUDES, BELIEFS, AND PRACTICES OF INFANT SAFE SLEEP

Presented by FRANCINE BONO-NERI

A candidate for the degree of Doctor of Philosophy

And hereby certify that the dissertation was read and approved by the committee.



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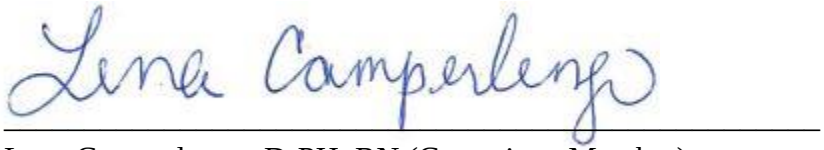

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Abstract

Background According to the Centers for Disease Control and Prevention (CDC), about 3,600 infants died suddenly and unexpectedly in the US in 2017 (CDC, 2020a). These deaths occurred among infants less than 1 year of age, having no immediately obvious cause. These sudden unexpected infant deaths (SUID) have three commonly reported mortality (or vital records) codes, which include Accidental Suffocation and Strangulation in Bed (ASSB), Sudden Infant Death Syndrome (SIDS), and other ill-defined deaths (CDC, 2020b; Mathews, MacDorman, & Thoma, 2015). These infant fatalities, with *infant* defined as a newborn through 12 months of age, collectively fall under the umbrella term SUID. Upon investigation, most SUID often happen during sleep or in the infant's sleep area (CDC, 2020b). The American Academy of Pediatrics (AAP) issues recommendations to reduce the risk for SIDS, including infant safe sleep (ISS) strategies (AAP Task Force on Sudden Infant Death Syndrome, 2016). While healthcare professionals are urged by the AAP to model, endorse and teach SIDS risk reduction strategies such as ISS practices (AAP Task Force on Sudden Infant Death Syndrome, 2011; AAP Task Force on Sudden Infant Death Syndrome, 2016), not all are embracing this recommendation. Hospital nurses are uniquely situated to educate and model ISS practices, which directly impact infant care and influence caregiver sleep practices at home (Gelfer, Cameron, Masters, & Kennedy, 2013; McMullen, Fioravanti, Brown & Carey, 2016). Numerous studies have been done with the focus on inpatient Mother-Baby (MB) nurses' ISS practices, yet lacking are studies on inpatient pediatric nurses, who care for infants in the acute care setting, other than the immediate post-delivery units. The pediatric nurse works with populations encompassing broad age ranges in numerous areas such as the Emergency Department, pediatric floor, Pediatric Intensive Care Unit, and adolescent unit. Inpatient pediatric nurses may work as a Go-Where-Needed (GWN) member or, for staffing reasons, may be reassigned to a different unit where infants are admitted. When inpatient pediatric nurses do care for infants in these diverse areas, they need to practice ISS. Hospitalizations of infants provide an opportunity for inpatient pediatric nurses to practice, teach, reinforce, and model ISS with the aim of reducing SUID events in the hospital setting, as well as providing a greater impact on the caregivers' practices at home to reduce modifiable risk factors with an overall impact on SUID reduction.

Purpose The purpose of this study was to examine inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices who provided care for infants during hospitalization in the acute care setting.

Theoretical Framework Theory of Planned Behavior (Ajzen, 1985, 1991)

Methods A quantitative, descriptive study with a qualitative component to gain more depth of explanation with open-ended responses was used. Data were collected using a web-based survey comprised of multiple choice/select, yes/no, true/false, visual analog scales (VAS), and Likert-type scale questions (quantitative), and questions requiring the respondents to answer in their own words (qualitative). This survey was distributed to a sample of nurses, using the nationwide membership of Society of Pediatric Nurses (SPN) as a convenience sample. All returned surveys were then stratified to include those pediatric nurses who Registered Nurses (RN) that provided care to infants up to 12 months of age in the inpatient pediatric setting and excluded those who worked exclusively in MB units. The survey was developed within the framework of the Theory of Planned Behavior, by selecting, modifying, and combining two established instruments, as well as creating items to obtain applicable measures, pertaining to inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices. Distribution of the survey occurred electronically via

email. Descriptive statistics, t-tests, one-way ANOVA, and correlation procedures were conducted using SPSS 25, and thematic analysis was performed on narrative survey responses.
Results There were numerous associations identified and interesting findings with the variables of interest. The findings showed that a majority (74.6%) of inpatient pediatric nurses had full knowledge of the current 2016 AAP recommendations of ISS, with 67.8% reporting their practices were always to most of the time aligned with AAP recommendations. The findings of their colleagues' practices were significantly less aligned (25.9%). Although most inpatient pediatric nurses reported a positive attitude toward, high belief in, and strong influence by the AAP, findings showed inpatient pediatric nurses were also highly influenced by their colleagues' practices and parents of hospitalized infants. Only 39.5% of inpatient pediatric nurses reported full belief in a sleep-related/SIDS event occurring during a work-shift, and 27.3% fully self-recognized as a role model of ISS. Higher academic preparation and the presence of an ISS initiative/policy demonstrated many positive correlations, all of which were favorable toward higher ISS knowledge, attitude, belief, and practice scores.
Conclusions and Implications While this population of inpatient pediatric nurses are highly knowledgeable on AAP recommendations, their ISS practices continue to be less than 100% aligned with AAP recommendations in the hospital setting. Knowledge is not the sole factor for improving ISS practices, as other studies in the literature show. Influence of others, outside of the AAP, have a significant impact on ISS practices of both inpatient pediatric nurses and their colleagues. The presence of an ISS initiative/policy significantly impacts ISS overall and is therefore recommended to be initiated more. Higher academic preparation of inpatient pediatric nurses is encouraged, as it leads to greater knowledge, attitudes, beliefs, and practices, yielding better patient outcomes. Greater awareness of the role-modeling responsibility of inpatient pediatric nurses needs to be instilled, as they serve as living examples, not only to parents of hospitalized infants but, also to all colleagues involved in caring for these infants.

Dedication

I dedicate this dissertation to my husband, James Neri, and to my four boys - Jimmy, Michael, Nico, and Vincent. I am so blessed to have you. You all are my greatest joy, my greatest pride, and my greatest loves.

To my husband and best friend -

Jim, thank you for sharing this journey with me. Although peaceful at times, there were times when the burden was incredibly overbearing and the stress all-consuming. Thank you for being the man that you are and for always standing by my side. I love you and never, never, never could have done it without you!

To Jimmy, Michael, Nico, and Vincent -

I love you, my mammas. Thank you for being so patient and understanding, especially during those times when I needed to be in my office for hours on end, or away from home. You four are my most precious gifts and my greatest work.

Yes, Vincent….you are getting your mamma back.

Mamma vi vuole tanto, tanto bene. Tantissimi bacioni a tutti voi!

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Dr. Lena Camperlengo, an expert in this field and co-founder of the SUID and SDY Case Registry at the CDC, has brought such precision to this work. She always made sure my words were consistent with the language used in the literature, as she is part of the community who wrote it. Her vast knowledge on this topic and on TPB kept my variables aligned with what I was seeking. She is an absolute marvel, and I am simply in awe of her. Thank you for saying yes!

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I would also like to thank Theresa Rienzo for her *countless* hours facilitating my review of the literature. Bernadette Weldon, I am forever grateful for your encouragement, help, and the talks and laughs shared. Dr. Lawrence DiFiore, my deepest gratitude for your guidance and statistical expertise. Professore, sei un angelo e ti ringrazio, per sempre!

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CHAPTER ONE: INTRODUCTION

Despite the significant advances in healthcare and technology seen in present day, infant mortality rate (IMR) in the United States remains one of the highest among developed nations (MacDorman, Mathews, Mohangoo, & Zeitlin, 2014). Approximately 3,600 infants die suddenly and unexpectedly, without an immediately obvious cause of death annually in America. These deaths include Accidental Suffocation and Strangulation in Bed (ASSB), Sudden Infant Death Syndrome (SIDS), and other ill-defined deaths (CDC, 2020a, 2020b). These fatalities collectively fall under the umbrella term known as *Sudden Unexpected Infant Death* (SUID), with *infant* defined as a newborn through 12 months of age (Figure 1). This term describes any sudden and unexpected death with no immediate known cause of death (COD) occurring during infancy. Ultimately, through investigation, some can be explained while others cannot, thus remaining as SIDS or unknown cause of death (CDC, 2020b). Three specific CODs, which fall under the SUID term, are ASSB, SIDS and unknown (with corresponding ICD-10 codes of W75, R95 and R99 respectively; Table 1), are often found to occur during sleep or in the baby's sleep area (CDC, 2020b).

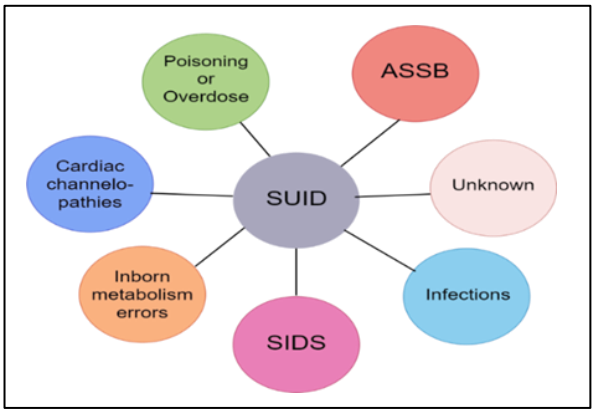

Figure 1. Sudden Unexpected Infant Death (SUID). This figure illustrates the various CODs that fall under the umbrella term of SUID. Adapted from "SIDS, SUID and Other Sleep-Related Infant Deaths: Keeping Babies Safe by Healthy Child Care America", 2014 (https://slideplayer.com/slide/13127472). Copyright 2011 by Borchardt Consulting. Adapted with permission.

Table 1 *ICD-10 Codes Commonly Used to Classify Unexplained Infant Deaths in the US*	
ICD-10 Code	ICD-10 Label
R95	Sudden infant death syndrome (SIDS)
R99	Unknown Cause
W75	Accidental suffocation and strangulation in bed (ASSB)

SIDS, as a subcategory of SUID, is a diagnosis of exclusion. It is assigned to infant deaths that cannot be explained after a thorough case investigation, which includes a death scene investigation, autopsy, and review of the clinical history (AAP Task Force on Sudden Infant Death Syndrome, 2016; Ball & Volpe, 2013). SIDS is the fourth leading cause of infant mortality in the United States (CDC, 2020c).

While SUID may be a modern-day term, occurrences as such can be found in the Bible.

> 18 "Sir," one of them began, "we live in the same house, just the two of us, and recently I had a baby. When it was three days old, this woman's baby was born too. 19 But her baby died during the night when she rolled over on it in her sleep and smothered it. 20 Then she got up in the night and took my son from beside me while I was asleep, and laid her dead child in my arms and took mine to sleep beside her (1 Kings 3:18-20)

Although historical accounts have existed since Biblical times, it was not until Bruce Beckwith, a pediatric pathologist, coined the term SIDS at a 1969 international conference about sudden deaths in infants (Beckwith, 1973). He defined SIDS as the sudden death of any infant or young child, which is unexpected and which a thorough post-mortem examination fails to demonstrate an adequate cause of death. A subsequent definition limited SIDS to infants less than 1 year of age and added that a death scene investigation be mandatory (Willinger, James, & Catz, 1991). In addition, any cases that remain unresolved following a thorough case investigation could be classified as undetermined or unexplained.

The American Academy of Pediatrics issues a policy statement titled *SIDS and Other Sleep-Related Infant Deaths: Recommendations for a Safe Infant Sleeping Environment*, which is

based on scientific research, epidemiologic studies, and current literature. “This document focuses on the subset of SUID that occur during sleep with recommendations for a safe infant sleeping environment” (AAP Task Force on Sudden Infant Death Syndrome, 2016, p. 2). These AAP recommendations are updated every five years, with the most current having been issued in 2016. These recommendations are “developed to reduce the risk of SIDS and sleep-related suffocation, asphyxia, and entrapment among infants in the general population” (AAP Task Force on Sudden Infant Death Syndrome 2016, p. 2). Risk refers to the probability that an outcome may occur given the presence of a particular factor or set of factors (AAP Task Force on Sudden Infant Death Syndrome, 2016). There are 19 recommendations in total. They are categorized into Level A, Level B and Level C, according to their strength, in descending order, with Level A as the highest, based on the Strength-of-Recommendation Taxonomy (SORT; Ebell et al., 2004). Table 2 lists the recommendations and their strength. Several of the various risk factors for SIDS may be associated with unsafe sleep (AAP Task Force on Sudden Infant Death Syndrome, 2011, 2016). Therefore, the AAP has expanded its recommendations to focus on a safe sleep environment and other recommendations, as seen in Table 2, that can reduce the risk of SIDS (AAP Task Force on Sudden Infant Death Syndrome, 2016).

Table 2 *AAP Summary of Recommendations with Strength of Recommendations (2016)*		Applicable to current study
A-level recommendations	Back to sleep for every sleep	X
	Use a firm sleep surface	X
	Breastfeeding is recommended	X
	Room sharing with infant on a separate sleep surface is recommended	X
	Keep soft objects and loose bedding away from the infant's sleep area	X
	Consider offering a pacifier at naptime and bedtime	X
	Avoid smoke exposure during pregnancy and after birth	
	Avoid alcohol and illicit drug use during pregnancy and after birth	
	Avoid overheating	X
	Pregnant women should seek and obtain regular prenatal care	
	Infants should be immunized in accordance with AAP and CDC recommendations	
	Do not use home cardiorespiratory monitors as a strategy to reduce the risk of SIDS	
	Health care providers, staff in newborn nurseries and NICUs, and child care providers should endorse and model the SIDS risk-reduction recommendations from birth	X
	Media and manufacturers should follow safe sleep guidelines in their messaging and advertising.	
	Continue the "Safe to Sleep" campaign, focusing on ways to reduce the risk of all sleep-related infant deaths, including SIDS, suffocation, and other unintentional deaths. Pediatricians and other primary care providers should actively participate in this campaign	
B-level recommendations	Avoid the use of commercial devices that are inconsistent with safe sleep recommendations.	
	Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly	
C-level recommendations	Continue research and surveillance on the risk factors, causes, and pathophysiologic mechanisms of SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely	
	There is no evidence to recommend swaddling as a strategy to reduce the risk of SIDS	

The first AAP recommendation for a nonprone sleeping position, which included back or side-sleeping for infants, was issued in 1992 (AAP Task Force on Infant Position and SIDS, 1992). Thereafter, the national *Back to Sleep* campaign, which began approximately 2 years

later, emphasized the same recommendation (Hauck & Tanabe, 2008; Willinger, Hoffman, & Hartford, 1994). Trends in SUID show a significant decrease in SIDS numbers post-1990s AAP recommendations and the *Back to Sleep* campaign, suggesting that this decrease in cases was attributed to the nonprone recommendation (Figure 2). In 2000, based on new epidemiologic evidence, the AAP recommended only back sleeping as the preferred position (AAP Task Force on Infant Position and SIDS, 2000).

In the United States, non-supine sleeping rates have declined approximately 69% from 1992 to 2016, and supine sleeping rates have increased from 13% to 78% over that period (CDC, 2018; Hauck & Tanabe, 2008; Hirai et al., 2019). Although a decline in SIDS and combined SUID (ICD-10 codes R95, R99, and W75 specific) rate was initially seen in the mid-1990s, these numbers hit a plateau and currently appear to be on the rise with SUID remaining as leading causes of infant mortality in the US (Figure 2).

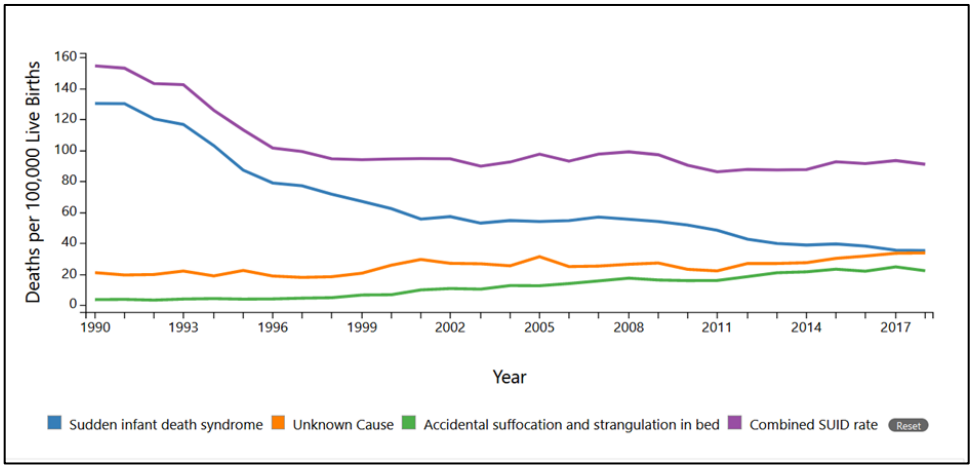

Figure 2. Trends in Sudden Unexpected Infant Death by Cause, 1990-2018. This graph shows the trends in sudden unexpected infant death (SUID) rates in the United States from 1990 through 2018 (CDC, 2020b).

Healthcare professionals (HCP) are advised by the AAP to endorse and educate parents about infant safe sleep (AAP Task Force on Sudden Infant Death Syndrome, 2016). Nurses are

uniquely situated to practice, educate, and model correct sleep positioning and a safe sleep environment, which may directly impact infant care after discharge (McMullen, Fioravanti, Brown, & Carey, 2016). Studies of nurses working in Mother-Baby (MB) units reveal poor compliance and inconsistent modeling of AAP recommendations (Bartlow, Cartwright & Shefferly, 2016; McMullen et al., 2016; Stastny, Ichinose, Thayer, Olson & Keens, 2004). Recommendations and interventions to change infant sleep-related practices of parents and HCPs are clearly documented in the literature (AAP Task Force on Sudden Infant Death Syndrome, 2016; Hodges, 2016; Moon, Hauck, & Colson, 2016; Sleutel, True, Gustus, Baldwin, & Early, 2018). Although the literature reveals studies that include nurses working in MB units, lacking are studies with inpatient pediatric nurses and their knowledge, attitudes, beliefs, and practices in ISS implementation on infants seen in their practice.

Problem Statement

It has been over 25 years since the 1994 *Back to Sleep* public awareness campaign and first AAP Policy Statement on ISS were released with documented decreases in rates of prone infant sleeping and an associated drop in SIDS. Yet, these decreases have plateaued in the past decade (AAP Task Force on Sudden Infant Death Syndrome, 2016). SUID rates, with the three commonly reported types of SUID identified as SIDS, ASSB, and unknown causes, are at approximately 3,600 per year (CDC, 2020a). SIDS is one of the top five causes of infant mortality in the US (CDC, 2020c). HCPs are "critical role models for parents and caregivers, and the way they position infants in the hospital strongly influences parental practices at home" (Gelfer, Cameron, Masters, & Kennedy, 2013, p. e1264). HCPs are urged by the AAP to role model, endorse and teach ISS, yet studies show that not all are embracing this recommendation. Since nurses comprise the greatest portion of HCPs and are consistently being ranked highest for

honesty and ethics (Gallup, 2020), they can have a significant influence on parents and caretakers of infants to help teach and model ISS. In addition, nurses are responsible for much of the education parents receive and their practices are closely observed by parents (Moon et al., 2016). Prior studies have focused on MB nurses and their ISS knowledge, attitudes, beliefs, and practices, but lacking are studies on inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices.

Purpose

The purpose of this study was to examine inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices who provided care for infants during hospitalization in the acute care setting. For this study, pediatric nurses were defined as nurses who provided care to infants during hospitalization, in any area of an acute care inpatient setting, which excluded MB units.

Significance

Although there was a 50% reduction seen after the 1990s AAP infant safe sleep recommendations and the *Back to Sleep* campaign, there has been a plateau seen in SIDS rates. Moreover, there is a noted rise in infant deaths associated with an unsafe sleep environment, although not recognized due to coding shifts in causes of death (Goldstein et al., 2019). While preterm birth and congenital defects, as the top two causes of infant deaths in the US, are more difficult to address, SUID/SIDS reduction strategies are low-cost and can be easy to implement. Parents may not always have a true perception of their own risk or cultural customs may dictate practices (Moon et al., 2016). Asian Americans have the lowest rates of SIDS, yet culturally sleep with their infants, but have the highest rates of breastfeeding initiation and duration at 6 and 12 months than any other ethnic group, which reduces the incidence of SIDS by 60-70% (Thompson et al., 2017).

Over 250,000 infants are admitted to the hospital each year (Newberry, 2019). These hospitalizations, defined as any infant admission through the age of 12 months, *after* the birth admission (signifying Pediatric Units, not MB units), coincide with the ages in which infant deaths occurs due to SIDS and other types of SUID. These hospitalizations are times when inpatient pediatric nurses must implement ISS practices, as well as be influential teachers and role models for parents caring for their infant in the hospital and after discharge to promote healthy behaviors at home.

The CDC has developed an integrated information and communication system for public health named WONDER - Wide-ranging ONline Data for Epidemiologic Research (CDC, 2020d). The WONDER application is an “easy-to-use, menu-driven system that makes the information resources of the CDC available to public health professionals and the public at large. It provides access to a wide array of public health information” (CDC, 2020d, para. 1), serving as a public resource that makes many health-related data sets available to CDC staff, public health departments, researchers, healthcare providers and others (CDC, 2020d). These data help with public health research, decision making, priority setting, program evaluation, and resource allocation. With CDC WONDER, there is the capability to access statistical research data published by CDC, as well as reference materials, reports, and guidelines on health-related topics; query numeric data sets on CDC's computers via "fill-in-the blank"; and web pages, obtain public-use data sets for query regarding mortality (deaths), disease incidence, natality (births), census data, and many other topics. In addition, the queried data are readily summarized and analyzed, with dynamically calculated statistics, charts, and maps.

Using WONDER, this researcher performed secondary data analysis in March 2019, selecting the three specific ICD-10 codes of infant deaths of R95, R99, and W75 (Table 1) used

to code COD of SUID from the three most recent years available (2015, 2016, 2017) in the database. In addition to selecting the ICD-10 codes and the years stated, two other parameters were chosen. The first was *medical facility - inpatient*. This parameter is specific to an inpatient hospital location, which excludes outpatient, emergency room (ER), dead on arrival, decedent's home, hospice facility, long-term care facility, unknown, and other. The last parameter selected was of infants aged < 1 day to 6 days old, looking to pull data on those infants predominantly from a MB unit. The result of this query yielded a number of 192 (Figure 3). Another analysis was performed at the same time, using identical parameters, but the age of the infant at time of death was selected as 7 days to 364 days old, looking to pull numbers of those infants who would predominantly be from non-MB units, such as those from inpatient pediatric units. This query yielded 1,289 (Figure 4).

2015, 2016, 2017	
State ⬇	➡ Deaths ⇧⇩
Alabama (01)	12
California (06)	19
Georgia (13)	20
New York (36)	10
Ohio (39)	15
Texas (48)	24
Total	192

2016, 2017, 2018	
State ⬇	➡ Deaths ⇧⇩
Alabama (01)	10
California (06)	15
Georgia (13)	15
Ohio (39)	11
Texas (48)	20
Total	172

Figure 3. Secondary Data Analysis CDC WONDER: (Left) ICD-10 of R95, R99, W75; Infant Age Groups < 1 day to 6 days old; Years 2015, 2016, 2017; Place of Death Medical Facility – Inpatient. (Right) ICD-10 of R95, R99, W75; Infant Age Groups < 1 day to 6 days old; Years 2016, 2017, 2018; Place of Death Medical Facility – Inpatient.

2015, 2016, 2017		2016, 2017, 2018	
State	Deaths	State	Deaths
Alabama (01)	161	Alabama (01)	199
Arizona (04)	23	Arizona (04)	20
Arkansas (05)	14	Arkansas (05)	12
California (06)	95	California (06)	89
Colorado (08)	19	Colorado (08)	16
Florida (12)	58	Connecticut (09)	10
Georgia (13)	48	Florida (12)	65
Illinois (17)	49	Georgia (13)	45
Indiana (18)	73	Illinois (17)	51
Kentucky (21)	22	Indiana (18)	77
Louisiana (22)	42	Iowa (19)	12
Maryland (24)	13	Kansas (20)	13
Michigan (26)	24	Kentucky (21)	19
Minnesota (27)	23	Louisiana (22)	36
Mississippi (28)	16	Maryland (24)	13
Missouri (29)	17	Michigan (26)	23
Montana (30)	12	Minnesota (27)	14
Nebraska (31)	13	Mississippi (28)	17
Nevada (32)	10	Missouri (29)	15
New Jersey (34)	19	Nebraska (31)	12
New York (36)	45	Nevada (32)	17
North Carolina (37)	44	New Jersey (34)	23
Ohio (39)	44	New York (36)	46
Oklahoma (40)	16	North Carolina (37)	43
Pennsylvania (42)	42	Ohio (39)	50
South Carolina (45)	12	Oklahoma (40)	15
Tennessee (47)	33	Pennsylvania (42)	50
Texas (48)	127	South Carolina (45)	14
Utah (49)	14	Tennessee (47)	35
Virginia (51)	30	Texas (48)	124
Washington (53)	19	Utah (49)	13
Wisconsin (55)	16	Virginia (51)	24
Total	1,289	Washington (53)	25
		Wisconsin (55)	17
		Total	1,327

Figure 4. Secondary Data Analysis CDC WONDER: (Left) ICD-10 of R95, R99, W75; Infant Age Groups 7 days to 364 days old; Years 2015, 2016, 2017; Place of Death Medical Facility – Inpatient. (Right) ICD-10 of R95, R99, W75; Infant Age Groups 7 days to 364 days old; Years 2016, 2017, 2018; Place of Death Medical Facility- Inpatient.

In April 2020, identical analyses were performed, but with updated data from the year 2018, then available in CDC WONDER. Hence, data were pulled for the years 2016, 2017, and 2018 with infants aged < 1 day to 6 days old, which yielded 172 (Figure 3), a noted decrease from the analysis performed in the year prior. Another analysis was run to pull data for the years 2016, 2017, and 2018, but with infants aged 7 days to 364 days old. The data yielded 1,327 (Figure 4), an increase from the analysis performed the prior year. Given these numbers of *medical facility – inpatient* infant deaths, with COD categorized as R95, R99, and W75 from this particular age range, those being predominantly from non-MB, pediatric units, and how data

show they are on the rise, it illustrated the need for this study and the importance for inpatient pediatric nurses to practice ISS with all infants in their care, and to role model and teach ISS with parental encounters during the infants' hospitalization.

Theoretical Frameworks

Theory of reasoned action. The Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980) posits that an individual's behavior is explained by beliefs and information based on the individual's subjective reality. Within the TRA, an individual's intention to perform a behavior is the immediate determinant of that behavior. Beliefs guide an individual's intention to behave as a function of both personal and social determinants. The personal determinants are reflective of the individual's attitude toward a specific behavior, or the relative value of outcomes to be achieved by performing that behavior. Social determinants refer to the individual's subjective norms, or the perceived expectations of others, related to a specific behavior, and the individual's motivation to comply with these expectations. According to TRA, if people evaluate the suggested behavior as positive (attitude), and if they think others want them to perform the behavior (subjective norm), this results in a higher intention (motivation) and they are more likely to perform the behavior.

TRA was developed to address actions and behaviors that were under an individual's volitional control (Ajzen, 1988). There are variables, such as personality and sociocultural variables, which can also affect behavior through their influence on the individual. The theory maintains that volition and intention predict behavior. However, usefulness of the theory to explain behaviors that were not under one's control was limited. Nurses are bound to their scope of practice. Therefore, this researcher looked further.

Theory of planned behavior: Theoretical framework for the study. The Theory of Planned Behavior (TPB; Ajzen, 1985, 1991), an extension of the TRA, includes the concepts of attitude, subjective norm, and motivation, but also includes the concept of perceived behavioral control as an antecedent to behavioral intent. Perceived behavioral control refers to the perception of an individual regarding the level of ease or struggle with the execution of a behavior, which is influenced and reflects past experiences, as well as perceived ability to overcome anticipated obstacles (Ajzen, 1985; Fleury, 1992). Overall, the more favorable the attitude and subjective norm with respect to a specified behavior, and the greater the perceived control over behavioral outcomes, the stronger the individual's intention to initiate the behavior in question would be (Ajzen, 1991). Individual behavior variances are related to specific situations and individual differences, according to Ajzen and Fishbein (1977). "For theoretical concepts to accurately predict behavior, attitudinal and behavioral measures must correspond in terms of the action, the target at which the action is directed, the context in which the action is performed, and the time at which the action is realized" (Fleury, 1992, p. 235).

The TPB provides a conceptual framework for understanding the determinants of human action (Ajzen, 2019a; Figure 5). It is a general model used to explain and predict behavior. It posits that the probability of engaging in a given behavior is determined by the intention to engage in the behavior, itself a function of one's attitude, subjective norm, and perceived control regarding the behavior with the relative importance of each dependent on the population and behavioral domain (Zemore & Ajzen, 2014). One's attitude toward a behavior is defined as one's personal evaluation of that behavior and is based on the positive and negative outcomes expected to be associated with it, which are behavioral beliefs. Subjective norm represents the perceived social pressures to engage in or avoid a given behavior and is based on the perceived normative

expectations of important referents, which are normative beliefs. Perceived control refers to one's perceived ability to perform a given behavior and is based on beliefs about factors that may facilitate or impede its performance, which are control beliefs. Control beliefs recognize factors that may either enhance or impede an individual's performance of a behavior (Ajzen, 1985, 1991). Because perceived control often reflects actual control, it is typically treated as a direct predictor of behavior as well as a predictor of intention. TPB also suggests that perceived control and intention may interact to affect behavior; that is the impact of intention on behavior may be stronger when perceived control is high (Zemore & Ajzen, 2014).

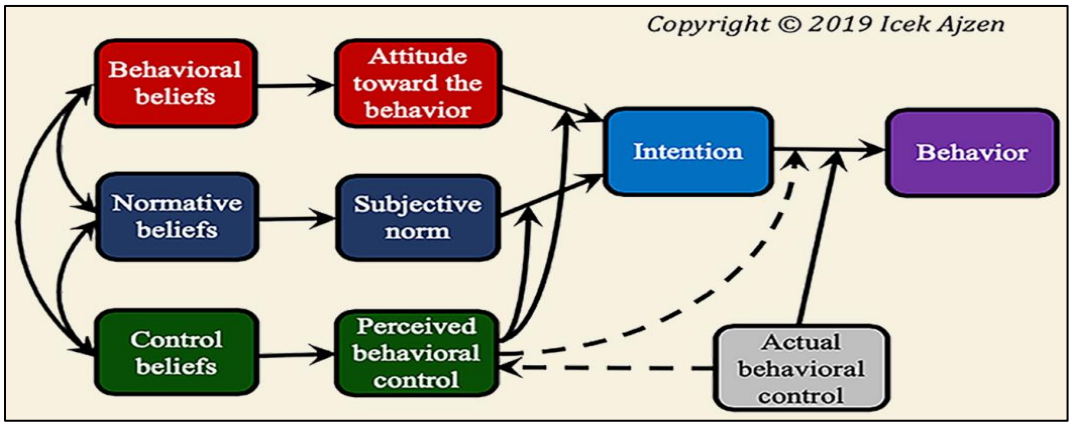

Figure 5. Theory of Planned Behavior Diagram. This figure illustrates the concepts and framework of TPB. From "Theory of Planned Behavior Diagram," by I. Ajzen, 2019b (https://people.umass.edu/aizen/tpb.diag.html). Copyright [2019] by Icek Ajzen. Reprinted with permission.

Theory of planned behavior: Application to the Study. TPB has been used in numerous studies to confirm the relationships among behavioral beliefs, normative beliefs, control beliefs, and intention to perform specified behaviors. Studies that have been conducted relating to individuals' health-promoting behaviors include adherence to condom use, adherence to medical regimen, alcohol abuse treatment, breastfeeding intention and duration, cigarette smoking cessation, exercise, and weight loss reduction (Asare, 2015; Kopelowicz et al., 2015; Palmeira et al., 2007; Zemore & Ajzen, 2014). Studies related to nursing behaviors include such topics as

adoption of healthcare information systems, patient safety behaviors, cultural sensitivity in treating patients of diverse backgrounds, attendance at continuing education programs, and pain assessment (Asare, 2015; Ifinedo, 2018; Javadi, Kadkhodaee, Yaghoubi, Maroufi, & Shams, 2013; Marrone, 2008).

This study was guided by the principles and constructs of the TPB, in which inpatient pediatric nurses' ISS beliefs and their attitude toward ISS served as *behavioral beliefs* and *attitude toward the behavior*; the perceived normative expectations of important referents, which included the AAP, inpatient pediatric nurses' healthcare professional colleagues (based on their infant sleep practices), and parents (dependent on satisfaction rating) served as *normative beliefs;* the inpatient pediatric nurses' belief and infant sleep practices, in relation to the beliefs of the AAP, healthcare professional colleagues (based on their infant sleep practices), and parents (dependent on satisfaction rating) served as a *subjective norm*; the presence of an ISS unit initiative/policy served as a *control belief*; and level of confidence and control of the inpatient pediatric nurses performing ISS practices served as a *perceived behavioral control* (Figure 6).

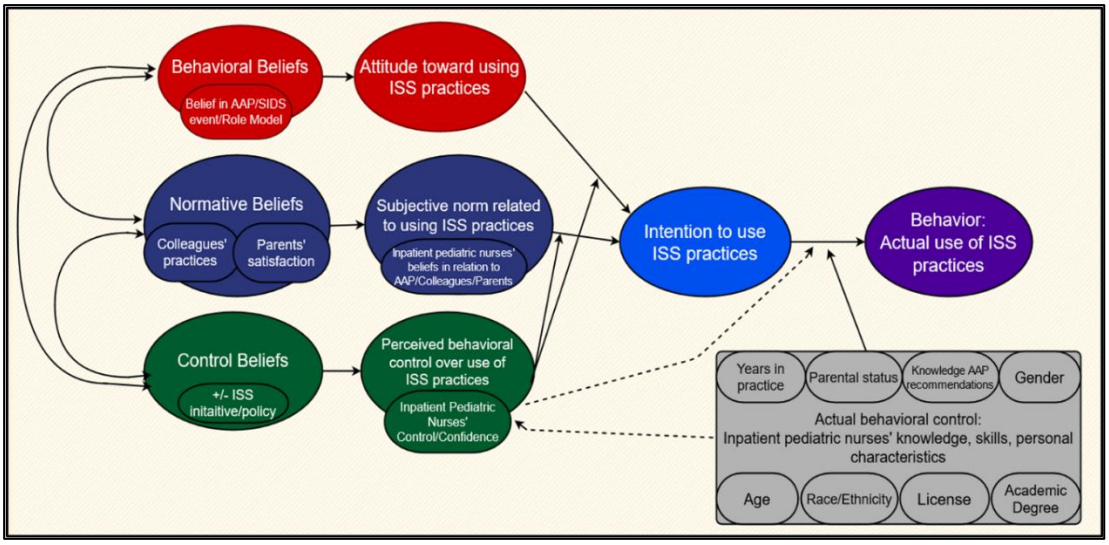

Figure 6. Model of Theory of Planned Behavior Applied to Study of Inpatient Pediatric Nurses and Infant Sleep Practices. This figure illustrates the variables of interest applied to TPB.

As clinicians, nurses' ability to implement practice, which is evidence based and health promoting, are contingent upon the ability to reason, think, and judge. These are directly dependent upon knowledge, experience, and nurses' attitudes and personal beliefs regarding the implementations (Benner, Hughes, & Sutphen, 2008; Ross, Bevans, Brooks, Gibbons, & Wallen, 2017). According to Ajzen and Fishbein (1977), individual behavior will vary with both situation and with interindividual differences. In addition, personality and social/cultural variables (such as breastfeeding and sleep surface sharing are accepted norms in several cultures) affect behavior through their influence on the attitudinal and normative components of the model (Fleury, 1992). Nurses are from varied cultural backgrounds and, therefore, behavioral beliefs can produce a favorable or unfavorable attitude toward the behavior in question (Ajzen, 2019a).

Important referents to inpatient pediatric nurses are the AAP, inpatient pediatric nurses' healthcare professional colleagues (based on their infant sleep practices), and parents (dependent on satisfaction rating), serving as normative beliefs in the current study (Figure 6). Satisfaction has been defined as patients' needs, experiences in care, and perception of care (Latour et al., 2011; Segers, Ockhuijsen, Baarendse, van Eerden, & van den Hoogen, 2019). *Patient satisfaction* is a term that has its roots from consumer marketing (Kupfer & Bond, 2012). It is a measure of how products or services meet, fall below, or exceed the anticipated expectations of the customer. In this regard, the quality of the service rendered is measured against the customer's expectations (Kupfer & Bond, 2012). If the service approximates the expectations, the customer tends to be neutral with respect to service quality and satisfaction. If expectations are not met, the customer judges service quality as low. If the service expectations exceed the expectations, the customer judges service quality as high (Kupfer & Bond, 2012). For the current study, the service rendered is inpatient pediatric nurses' infant sleep practices and the customer is

the parent of the infant. This satisfaction rating is measured by post-admission surveys sent to assess satisfaction of the hospital stay experience.

According to TPB, these normative beliefs may influence inpatient pediatric nurses' infant sleep practices*;* the inpatient pediatric nurses' belief and infant sleep practices, in relation to the beliefs of the AAP, healthcare professional colleagues (based on their infant sleep practices), and parents (dependent on satisfaction rating) serve as a *subjective norm.*

Individual behavior is predicted based on a situation or opportunity, given an adequate degree of actual control. However, not all actions are under the volitional control of an individual; therefore, provided an individual is realistic in determining the degree of difficulty in performing a behavior, perceived behavioral control can act as a proxy for actual control and contribute to the intention to perform the behavior (Ajzen, 2019a). This directly applies to nurses implementing ISS and serving as role models to promote safe sleep in the inpatient setting. For theoretical concepts to accurately predict behavior, attitudinal and behavioral measures must correspond in terms of the action, the target at which the action is directed, the context in which the action is performed, and the time at which the action is realized.

In summary, TPB explains how beliefs and attitudes collectively affect action. This theory looks to explain behaviors with an understanding of how many different factors influence behaviors. This study uses TPB as the theoretical lens that will be used to discover the relationship of inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of ISS, as issued by the AAP.

Research Questions

Quantitative research questions. The following research questions guided the quantitative component and objectives of the study:

1. What are inpatient pediatric nurses' level of knowledge of the current American Academy of Pediatrics (2016) infant safe sleep recommendations?
2. What infant sleep practices do inpatient pediatric nurses report that they use on a pediatric floor in the hospital setting, and are they aligned with current American Academy of Pediatrics (2016) infant safe sleep recommendations?
3. Are there any relationships among inpatient pediatric nurses' demographic variables, academic degrees, years in practice, and their attitudes or beliefs of the scientific evidence used to establish infant sleep recommendations by the American Academy of Pediatrics?
    a. Are there any associations between nurses' personal characteristics and their knowledge, attitudes, beliefs, and practices of current American Academy of Pediatrics (2016) infant safe sleep recommendations?
    b. Are there any associations between inpatient pediatric nurses' degree and knowledge, attitudes, beliefs, and practices of current American Academy of Pediatrics (2016) infant safe sleep recommendations?
    c. Are there any associations between the number of years in practice of inpatient pediatric nurses and their knowledge, attitudes, beliefs, and practices of current American Academy of Pediatrics (2016) infant safe sleep recommendations?
    d. Are there any associations between inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of current American Academy of Pediatrics (2016) infant safe sleep recommendations and the infant sleep practices of inpatient pediatric nurses' healthcare professional colleagues?

e. Are there any associations between inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of current American Academy of Pediatrics (2016) infant safe sleep recommendations and parents' satisfaction?

Objectives. The objectives for the quantitative portion of this study were as follows:

A. To determine inpatient pediatric nurses' knowledge of the current American Academy of Pediatrics (2016) infant safe sleep recommendations.

B. To determine if inpatient pediatric nurses' knowledge of the current American Academy of Pediatrics (2016) infant safe sleep recommendations is dependent on their years in practice since graduation from nursing school.

C. To determine if inpatient pediatric nurses' attitudes and beliefs align with the current American Academy of Pediatrics (2016) infant safe sleep recommendations.

D. To determine if infant sleep practices implemented by inpatient pediatric nurses in the hospital setting align with the current American Academy of Pediatrics (2016) infant safe sleep recommendations.

E. To determine if infant sleep practices implemented by inpatient pediatric nurses in the hospital are influenced by infant sleep practices of their healthcare professional colleagues.

F. To determine if infant sleep practices implemented by inpatient pediatric nurses in the hospital are influenced by parents' and parent satisfaction.

Qualitative research questions. The following research questions guided the qualitative component and objectives of the study.

1. What are inpatient pediatric nurses' beliefs regarding the current American Academy of Pediatrics (2016) infant safe sleep recommendations?

2. What are inpatient pediatric nurses' level of trust in the credibility of the evidence behind these recommendations?
3. If an inpatient pediatric nurse is a parent, what were the sleep practices he/she followed with his/her child during infancy, and why?
4. What influence, if any, does parent satisfaction have on infant sleep practices inpatient pediatric nurses report they use in the inpatient pediatric hospital setting?

Objectives. The objectives for the qualitative component of this study were as follows:

1. To identify and describe the inpatient pediatric nurses' beliefs and level of trust regarding the recommendations of the AAP.
2. To determine if inpatient pediatric nurses' infant sleep practices were influenced by parent satisfaction.
3. To identify those inpatient pediatric nurses who were parents and determine if their past infant sleep practices were aligned with AAP recommendations at that time.

Definition of Terms

Infant

Infant refers to any baby younger than 1 year of age (CDC, 2020a).

Infant Safe Sleep (ISS) Practices

Infant safe sleep (ISS) practices are those practices that follow the current recommendations of the American Academy of Pediatrics (AAP, 2016) regarding infant safe sleep. The AAP issues recommendations to reduce the risk of SIDS and sleep-related suffocation, asphyxia, and entrapment among infants in the general population. They are categorized into Level A, Level B, and Level C (Table 2). These specify that infants should sleep alone, on a separate sleep surface without blankets or objects in a crib, on at firm mattress, and

on their backs. The AAP also indicates other measures that promote a safe sleep environment and risk-reducing measures for sleep-related deaths during infancy such as avoid overheating, promote breastfeeding, pacifier use at naptime and bedtime, and for HCP to endorse and model these SIDS risk-reduction recommendations.

Sudden Unexpected Infant Death

Sudden Unexpected Infant Death (SUID) is a term more commonly used in the US and describes any sudden and unexpected death that occurs during infancy, including SIDS, ASSB and ill-defined deaths (CDC, 2020a).

Sudden Infant Death Syndrome

Sudden Infant Death Syndrome (SIDS) is the sudden death of an infant under one year of age that remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the medical history (Beckwith, 1973).

Accidental Suffocation and Strangulation in Bed

Accidental suffocation and strangulation in bed (ASSB) is a cause of death code used to classify infants who died from suffocation or asphyxiation in the sleep environment. Mechanisms leading to ASSB are diverse and can include wedging between objects, strangulation from cords or ties, suffocation by soft bedding, or by an act of overlay (Gaw, Chounthirath, Midgett, Quinlan, & Smith, 2017).

Bed-sharing

Bed-sharing, also referred to as sleep-surface sharing, is the act of an infant sharing an adult bed or other surface with a parent, sibling, or another caregiver (AAP, 2016).

Crib

Crib is defined as an appropriate infant bed with barred or weaved sides surrounding the entire perimeter of the crib such as a bassinet, crib, Pack 'n Play®.

Demographic Variables

Demographic variables are items addressing individual characteristics such as age, gender, race, educational level, time working in pediatrics, current position, number of hours employed per week, and time in current position.

Entrapment

Entrapment is defined as the trapping of an infant between two objects such as a mattress and a wall causing cessation of breathing (U.S. Department of Health and Human Services, n.d.).

ICD-10 Codes

ICD-10 codes are the current version of the International Statistical Classification of Diseases and Related Health Problems (ICD) that codes any injury or disease condition along the entire life continuum from birth to death (World Health Organization [WHO], n.d.).

R95

R95 is the ICD-10 code for sudden infant death syndrome (SIDS; Table 1).

R99

R99 is the ICD-10 code for other ill-defined and unspecified causes of mortality (i.e., unknown cause; Table 1).

W75

W75 is the ICD-10 code for accidental suffocation and strangulation in bed (ASSB; Table 1).

Inpatient Pediatric Nurse

Inpatient pediatric nurse refers to any licensed, professional nurse who specializes in working with the pediatric population in a hospital or acute care setting within the scope of an RN (Society of Pediatric Nurses [SPN], 2006).

ISS Initiative/Policy

A standardized set of policies/protocols that are based on current AAP safe infant sleep recommendations put into effect on a particular unit or on an institution-wide basis, as a means to standardize ISS practices. Methods of implementation consist of teaching ISS practices, educating on safe infant sleep environments, and performing periodic audits to assess maintenance of the initiative/policy.

Knowledge of Current AAP Safe Infant Sleep Practices

Knowledge of current AAP safe infant sleep practices is having information and understanding of all current recommendations of the AAP (Table 2) regarding infant safe sleep and ways to reduce the risk of sleep-related deaths in the infant.

Overlay

A person overlaying or rolling on top of or against an infant while sleeping on a shared sleep surface and obstructing the airway or compressing the neck or chest area that inhibits respiration (Shapiro-Mendoza et al., 2014).

Prone Position

Prone position is the position when an infant is laying on his/her abdomen.

Role modeling

Role modeling is defined as the act (aware or unaware) of serving as a model of actions, behaviors, examples, and knowledge to those who are observing.

Role of the Nurse in Implementing and Teaching Infant Safe Sleep

Nurses play an important role in reducing the risk of SIDS and other sleep-related causes of infant death (National Institute of Child Health and Human Development [NICHD], n.d.). Through role modeling, educating, and messaging consistently with the AAP's recommendations, nurses can promote infant safe sleep practices. There are approximately 4.8 million RNs in the United States (National Council of State Boards of Nursing [NCSBN], 2020a), so the potential exists for nurses to reach many parents and promote adherence to safe infant sleep practices.

Room-Sharing

Room-sharing is the environment in which an infant sleeps in the same room as the parents, but on a separate sleep surface, such as a crib, bassinet, or play yard. This practice is recommended, ideally, for the first year after birth, but at least during the first 6 months of life when the rates of SIDS and other sleep-related deaths are highest (AAP Task Force on Sudden Infant Death Syndrome, 2016).

Sleep-Related Infant Death

Deaths linked to where or how a baby sleeps that include accidental causes, such as suffocation entrapment, overlay or strangulation (CDC, 2020a).

Supine Position

Supine position is the position when an infant is laying on its back, face up.

Triple Risk Model

Triple risk model (TRM; Figure 8) is the model which postulates that SIDS occurs with the convergence of three factors, which include 1) vulnerable infant, 2) critical developmental

period, and 3) exogenous stressors (Filiano & Kinney, 1994; Trachtenberg, Haas, Kinney, Stanley, & Krous, 2012).

Conceptual and Operational Definitions of Independent Variables

- *Knowledge of the Current AAP Safe Infant Sleep Recommendations* - This variable determined the degree to which inpatient pediatric nurses had knowledge of the most current 2016 Safe Infant Sleep Recommendations issued by the AAP. (Table 2). This variable was measured by gaining the sum of correctly identified responses from the corresponding items on the *Infant Sleep Practices* Tool. The higher the sum, the greater the inpatient pediatric nurses' knowledge of the AAP Safe Infant Sleep recommendations.
- *Attitudes* - This variable determined the degree to which inpatient pediatric nurses had a favorable or unfavorable evaluation or appraisal of each of the current 2016 AAP Safe Infant Sleep Recommendations. This variable was measured based on the 5-point Likert scale items on the *Infant Sleep Practices* Tool that corresponded to the attitudes of the inpatient pediatric nurses toward the AAP Safe Infant Sleep recommendations. The higher the sum of the scores, the more positive the attitude.
- *Beliefs* - This variable determined the degree to which inpatient pediatric nurses had an enduring premise about what was self-accepted as true based on their subjective reality. This variable was measured based on corresponding items and open-text fields on the *Infant Sleep Practices* Tool. This variable had the following subparts:
    - *Behavioral*: This variable determined the degree of inpatient pediatric nurses' belief in the 2016 AAP Safe Infant Sleep recommendations. The higher the sum of the score, the higher the belief in the AAP Safe Infant Sleep recommendations.

- *Control*: This variable determined the presence of an initiative/policy on ISS which serves as a standardized set of protocols that are based on current AAP safe infant sleep guidelines that must be followed for all infants admitted to the unit. This variable was measured by a yes/no answer to the corresponding item asking if this was present on their unit.
- *Perceived behavioral control*: Inpatient pediatric nurses' perceived control and confidence in performing ISS practices
    - *Control* - This variable determined the degree to which inpatient pediatric nurses had power over their capability to implement infant sleep practices. This variable was measured based on the corresponding item on the *Infant Sleep Practices* Tool. The higher the score, the higher the inpatient pediatric nurses' self-perceived power over their capability to implement infant sleep practices.
    - *Confidence* – This variable determined the degree to which inpatient pediatric nurses had self-belief in their capability to implement infant safe sleep practices. This variable was measured based on the corresponding item on the *Infant Sleep Practices* Tool. The higher the score, the higher the inpatient pediatric nurses' confidence in implementing infant safe sleep practices.
- *Normative*: This variable determined the perceived normative expectations of important referents of inpatient pediatric nurses which included the AAP, HCP colleagues' (based on their infant sleep practices), and parents (dependent on satisfaction rating).

- *Subjective Norm*: This variable determined the inpatient pediatric nurses' infant sleep practices in relation to influence from the AAP Safe Infant Sleep recommendations, HCP colleagues, and parents' satisfaction rating.
- *Self-recognition belief as Role Model:* This variable determined the degree of inpatient pediatric nurses' belief of self-recognition as a role model. The higher the score, the higher the inpatient pediatric nurses' belief in role model self-recognition.
- *Belief in an inpatient sleep-related/SIDS event could occur*: This variable determined the degree of inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift. The higher the score, the higher the inpatient pediatric nurses' belief that this type of event could occur.

Conceptual and Operational Definitions of Dependent Variable

- *Infant Sleep Practices* - This variable was defined as those actions and implementations of infant sleep measures that inpatient pediatric nurses used on the infant population at their workplace which were applicable to the pediatric inpatient hospital setting. This was measured gaining a sum score of the items on the *Infant Sleep Practices* tool that corresponded to those that identified the inpatient pediatric nurses' ISS practices that aligned with the AAP Safe Infant Sleep recommendations which were applicable to the study (Table 10). The higher the score, the greater the inpatient pediatric nurses' practices aligned with the 2016 AAP Safe Infant Sleep recommendations.

Summary

This chapter presented an overview of the problem and significance of SUID events seen in the US and in the hospitals, and the need for inpatient pediatric nurses to practice, teach, and

model ISS practices in the hospital setting. This chapter also presented the research questions of interest, the definitions of terms, and the independent and dependent variables for this research study. As the AAP continues to endorse ISS practices in healthcare members, not all are following this recommendation. Nurses, comprising the largest portion of the healthcare workforce, are ideally situated to educate, reinforce, and model correct sleep positioning and a safe sleep environment, which directly impact infant caretakers' practices after discharge.

CHAPTER TWO: LITERATURE REVIEW

Albert Schweitzer, the French-German theologian once said, “Example is not the main thing in influencing others. It is the only thing” (Martin & Ott, 2017, p. 87). The nursing profession is one of the largest in the US healthcare arena, consisting of greater than 4 million members (National Council of State Boards of Nursing [NCSBN], 2020a). Nurses, working in various settings, are constantly observed. Patients, family members, interdisciplinary colleagues, peers, and students watch their actions and interactions. Nurses serve as role models with the potential to influence the actions and attitudes of others in either positive or negative ways. Aware or unaware, their words and behaviors become living and compelling lessons.

This chapter provides an overview of literature with selected studies on infant safe sleep practices conducted that are applicable to study. The focus was on knowledge, attitudes, beliefs, and practices of nurses of varying roles and degrees. Additionally, topics of breastfeeding, role modeling, nurse-provided teaching and planning, and a unit-based ISS initiative/policy were included.

Background

The United States has one of the highest infant mortality rates in the world with approximately 3,600 infant deaths occurring suddenly and unexpectedly (CDC, 2020a; Mathews, MacDorman, & Thoma, 2015). These infant deaths include Sudden Infant Death Syndrome (SIDS), Accidental Suffocation and Strangulation in Bed (ASSB) and ill-defined deaths, or ‘unknown cause’ (AAP Task Force On Sudden Infant Death Syndrome, 2016; Mathews et al., 2015). Sudden unexpected infant death (SUID) is an umbrella term used to describe any sudden and unexpected, without an immediately known cause of death, occurring during infancy which include SIDS, ASSB, and ill-defined deaths (CDC, 2020a).

SIDS is defined as the death of any infant less than 12 months of age that cannot be explained after a thorough case investigation, including a scene investigation, autopsy, and review of the clinical history (Beckwith, 1973). With an ICD-10 code of R95, SIDS account for approximately 40% of reported SUID cases each year (CDC, 2020b).

Accidental suffocation and strangulation in bed (ASSB) is a cause of death, coded with an ICD-10 of W75, which is used to identify infants who die from suffocation or asphyxiation in the sleep environment. Mechanisms leading to ASSB are diverse and include wedging between objects, strangulation from cords or ties, suffocation by soft bedding, or by an act of overlay (Shapiro-Mendoza, Kimball, Tomashek, Anderson, & Blanding, 2009). Approximately 30% of all SUID cases in 2017 were ASSB (CDC, 2020b).

Although occurring up to one year of age, data show that the peak incidence of SIDS is between two and four months of age, with 90% occurring by six months. Less than 2% of cases occur after nine months of age (NICHD, n.d.). SIDS is one of the leading causes of infant mortality in the United States (CDC, 2020b; Mathews et al., 2015).

History of SIDS and the *Back to Sleep* Campaign

The sudden death of a seemingly healthy infant during sleep is not a modern-day phenomenon, as cases have been recorded throughout history for thousands of years. One of the first documented cases is in the Bible in 1 Kings 3:18-20. However, these deaths generally have been attributed to an act of overlay, as it was common practice to sleep in the same bed as a child (Duncan & Byard, 2018). By the seventh century, the death of an infant due to overlay was a punishable offense (Norvenius, 1993). Having a significant position and deeming it a sinful act, the church became involved.

Overlay was regarded as breaking the fifth commandment, *Thou shalt not kill*, so the church considered this infant death a sin and worthy of punishment. In the 16th century, clergymen were advised to warn parents against overlay (Norvenius, 1993). During the 18th century, a wooden and metal framed item, such as an arcuccio (Figure 7) found in Italy, was used for infants to sleep in, specifically for bed-sharing arrangements (Duncan & Byard, 2018; Keens, 2013).

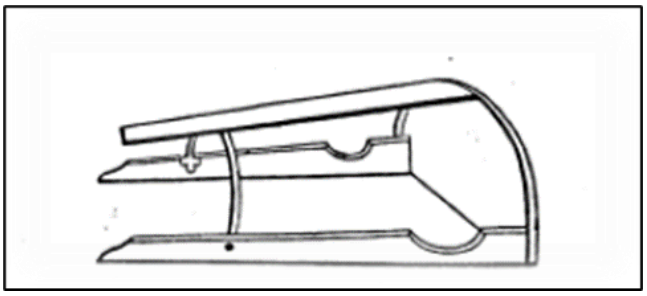

Figure 7. The Aruccio. This figure is an image of the apparatus used to prevent overlay on a shared sleep surface.

By the 19th century, so prevalent was the belief that overlaying caused an infant to die during sleep that the death was still attributed to this, even though evidence suggested otherwise. Calls were made for bed-sharing of parents with their infants to be illegal, especially if the parents were in an intoxicated state (Duncan & Byard, 2018). Today, although sudden infant deaths are not as frequently attributed to overlay, it is often impossible to exclude this possibility when death has occurred in a bed-sharing situation, which often leads to a diagnosis of "undetermined" (Duncan & Byard, 2018).

Efforts to reduce infant mortality continued, with the term *Sudden Infant Death Syndrome* appearing in the healthcare literature in the late 1960s (NICHD, n.d.). Soon after, Congress passed the Sudden Infant Death Syndrome Act in 1974. This act recognized the impact of SIDS as a public health issue and therefore put forth research efforts to improve infant outcomes. By the late 1980s, epidemiological studies from Europe and Australia showed that the prone sleeping position was associated with an increased incidence of SIDS and therefore urged

medical societies to issue recommendations of putting infants to sleep in a non-prone position (AAP Task Force On Sudden Infant Death Syndrome, 2011; Hein & Pettit, 2001). In response to these reports, in 1992, the AAP Task Force recommended that all infants be placed to sleep in a supine or side-sleeping position to reduce the risks of SIDS (Hein & Pettit, 2001). In 1994, this recommendation was reiterated, along with recommendations to avoid soft bedding and objects in the infant's sleep environment.

Combining efforts that same year, a coalition was formed including the National Institute of Child Health and Human Development (NICHD), the Public Health Service (PHS), the Association of SIDS and Infant Mortality Programs (ASIP), the National Heart, Lung, and Blood Institute (NHLBI), the AAP Task Force, and the SIDS Alliance, which is now known as First Candle (NICHD, n.d.b). This coalition launched the *Back to Sleep* Campaign, which urged parents and HCPs to place infants on their backs or sides, but not prone, for sleep (Hein & Pettit, 2001). By 2000, research demonstrated the instability of side-position sleeping and its increased risk of SIDS, so the AAP Task Force emphasized that babies be placed to sleep wholly on their backs because that position was associated with the lowest SIDS risk (Hein & Pettit, 2001; NICHD, n.d.b).

Due to the recommendations in the 1990s, along with the Back to Sleep Campaign, rates of SIDS dropped by more than 50% over a 10-year period between 1994 and 2004 (CDC, 2020b). Today, current data are not showing any consistent or further reduction in incidence of SIDS and have, in fact, plateaued since 2005. It is important to note that the use of the term *SIDS* is becoming increasingly controversial (Beckwith, 2003; Duncan & Byard, 2018). In addition, a shift in diagnostic coding has been observed in recent years (Shapiro-Mendoza et al., 2018). This shift has seen a reduced application of the term *SIDS* as a diagnosis of death, with many

professionals certifying deaths into other causes such as “undetermined, unknown” (Malloy & MacDorman, 2005). With this diagnostic shift, accuracy and recognition of incidence is undermined and therefore, so are the numbers regarding prevalence of SIDS, ASSB, and Unknown Cause. Concurrently, rates of ASSB started increasing in 1997 and is documented at 24.6 deaths per 100,000 live births for 2017 (CDC, 2020b).

Triple-Risk Model

The definitive cause of SIDS is unknown. Multiple theories have emerged over time to explain SIDS. The most accepted theory of SIDS pathogenesis is the Triple-Risk Model (TRM; Filiano & Kinney, 1994) which proposes that a triad of risk factors must be present simultaneously (Figure 8). The TRM describes the convergence of three conditions that could place an infant more at risk for SIDS. The combination of these three factors, 1) vulnerable infant, 2) critical development period and 3) exogenous stressors, once converged, may lead to “a combination of progressive asphyxia, bradycardia, hypotension, metabolic acidosis, and ineffectual gasping, leading to death” (Moon & AAP Task Force on Sudden Infant Death Syndrome, 2016, e5). The following are descriptions of the three risk factors in the TRM.

Vulnerable infant. The belief is that infants who die from SIDS have an innate, undetected brain or genetic abnormality, or immaturity that causes vulnerability. This situation may directly impact the cardiorespiratory and/or arousal system of the infant (Filiano & Kinney, 1994). Evidence exists to support the vulnerable infant hypothesis. Some post-mortem studies of infants whose cause of death was found as SIDS indicate central nervous system and/or systematic abnormalities, including evidence of brainstem dysfunction, which is responsible for the coordination of respiratory, arousal, and autonomic functions (Filiano & Kinney, 1994; Kinney, Richerson, Dymecki, Darnall, & Nattie, 2009; Moon & AAP Task Force on Sudden

Infant Death Syndrome, 2016, Paterson et al., 2006). Such dysfunctions could impair arousal reflexes from sleep that normally would protect an infant in the event of a sleep-related stressor (Filiano & Kinney, 1994). The hypothesis of the vulnerable infant continues to be supported by evidence of maternal and pregnancy-related risk factors. Young maternal age, maternal smoking, alcohol, and/or drug use, not breastfeeding, prematurity, and low birth weight are some of the factors that adversely influence the uterine environment, fetal genetic composition and/or potentiate developmental delays yielding the development of a vulnerable infant (Filiano & Kinney, 1994; Horne, Parslow, Ferens, Watts, & Adamson, 2004; Moon & AAP Task Force on Sudden Infant Death Syndrome, 2016).

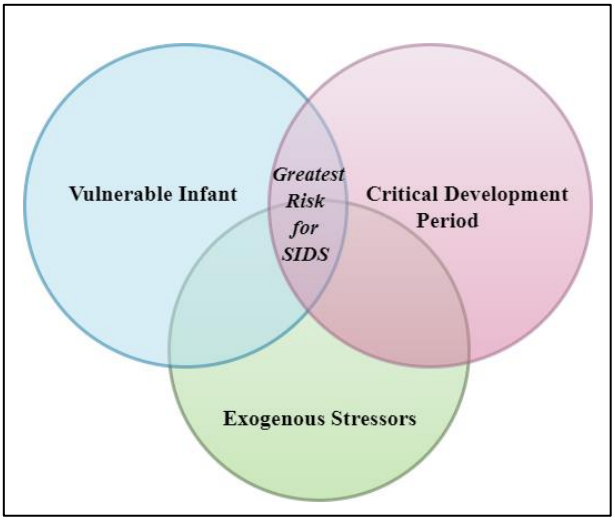

Figure 8. The Triple-Risk Model (TRM). This Venn diagram shows the triad of risk factors of the TRM and illustrates the point of convergence where the greatest risk for SIDS occurs.

Critical development period. SIDS deaths have a distinct age distribution pattern. Although occurring up to one year of life, SIDS has a unique age-at-death distribution, with approximately 80% of SIDS occurring in the first four months of life, with a peak typically observed at 2-3 months of age with 90% occurring by 6 months of age, and < 2% of cases occurring after nine months of age (Corwin, 2020; Shapiro-Mendoza et al., 2018). Major

changes occur in essentially all physiologic systems during this period of development, which include transitions in homeostatic systems regulated by the brain, notably autonomic control, ventilation, sleep-waking organization, temperature regulation, and circadian rhythm (Filiano & Kinney, 1994). Some of these key physiological changes may play a role in SIDS.

Exogenous stressor(s). Outside stressors may be the triggering factors that cause SIDS events among vulnerable infants during their critical period of development (Trachtenberg et al., 2012). Potential environmental stressors that are known risk factors for SIDS include overheating, infants not breastfeeding/being offered breastmilk, prone sleeping position, exposure to tobacco smoke, and as well as recent respiratory or gastrointestinal illness or fever (AAP, 2011b; Trachtenberg et al., 2012). The TRM demonstrates how infants who appear clinically normal can die of SIDS if their vulnerable homeostatic controls are overwhelmed by an outside stressor. It also gives a possible explanation for the variability in SIDS deaths. For example, it helps to explain why not all infants who die of SIDS have the same exogenous stressors present and why not all infants who sleep in the prone position die of SIDS (Filiano & Kinney, 1994).

Present-Day Infant Safe Sleep Recommendations

SIDS is the fourth leading cause of death in infants in America, as one type of SUID. Put forth every five years, the AAP releases a policy statement on recommendations for infant safe sleep (ISS). In 2016, the AAP released its most current recommendations. These recommendations are "developed to reduce the risk of SIDS and sleep-related suffocation, asphyxia, and entrapment among infants in the general population" (AAP Task Force on Sudden Infant Death Syndrome, 2016, p. 2). Risk refers to the probability that an outcome may occur given the presence of a particular factor or set of factors (AAP Task Force on Sudden Infant

Death Syndrome, 2016). There are 19 recommendations in total. They are categorized into Level A, Level B, and Level C, according to the strength of the recommendation, based on the Strength-of-Recommendation Taxonomy (SORT; Ebell et al., 2004). Table 2 lists the recommendations and indicates the strength of each recommendation. The levels are based on SORT to assign letter grades to each of its recommendations (A, B, or C). Level A recommendation signifies there is good-quality, patient-oriented evidence. Level B signifies there is inconsistent or limited-quality patient-oriented evidence. Level C signifies the recommendation is based on consensus, disease-oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening (AAP Task Force on Sudden Infant Death Syndrome, 2016).

Level A recommendations. There are 19 recommendations in total, with 15 categorized as Level A. The most prominent and well-known are those identified as the ABCs of safe sleep. These are representative of **a**lone, on the **b**ack, and in a **c**rib for every sleep.

To reduce the risk of SIDS, infants should be placed for sleep in a supine position, meaning entirely on their back, for every sleep by every caregiver until the infant reaches 1 year of age (AAP Task Force on Sudden Infant Death Syndrome, 2016). Side sleeping, which was a previous AAP recommendation, is not safe and therefore is no longer recommended. Studies established prone and side sleeping as risk factors for SIDS that include infants up to 1 year of age. Therefore, the best evidence suggests that infants should continue to be placed supine until 1 year of age.

Another 2016 AAP recommendation is infants should be placed on a firm sleep surface (e.g., mattress in a safety-approved crib) covered by a fitted sheet with no other bedding or soft objects to reduce the risk of SIDS and suffocation. Firm surfaces maintain their shape and will

not indent or conform to the shape of the infant's head when the infant is placed on the surface. Mattresses that are soft, which include those made from memory foam, could create an indentation or pocket, and increase the chance of rebreathing or suffocation, if the infant is placed in or rolls over to the prone position (AAP Task Force on Sudden Infant Death Syndrome, 2016).

A crib, bassinet, portable crib, or play yard that conforms to the safety standards of the Consumer Product Safety Commission, including those for slat spacing less than 2-3/8 inches, snugly fitting and firm mattresses, and no drop sides, is recommended. Soft materials or objects, such as pillows, quilts, comforters, or sheepskins, even if covered by a sheet, should not be used.

Included in Level A is the recommendation for breastfeeding which has been shown in several studies to be associated with a decreased risk of SIDS (Hauck, Thompson, Tanabe, Moon, & Vennemann, 2011; Horne et al., 2004; Thompson et al., 2017). Unless contraindicated, mothers should breastfeed or feed with expressed milk (i.e., not offer any formula or other non-human milk-based supplements) for 6 months, in alignment with recommendations of the AAP (2011). The protective effect of breastfeeding increases with prolonged duration. However, any breastfeeding has been shown to be more protective against SIDS than no breastfeeding (Hauck et al., 2011).

Level B and C recommendations. There are 19 recommendations in total. The first 15 are labeled Level A. The remaining 4 are Levels B and C. These include avoiding the use of commercial devices that are inconsistent with safe sleep recommendations; recommendations for supervised, awake tummy time to facilitate development and minimize positional plagiocephaly development; recommendations to continue research and surveillance regarding risk factors, causes, and pathophysiologic mechanisms of SIDS/SUID with the ultimate goal of eliminating

these deaths entirely; and the final recommendation states that there is no evidence that swaddling can be used as a strategy to reduce the risk of SIDS.

Review of Literature

Clinical practice guidelines, evidence-based practice, and HCP adherence. The literature demonstrates that advances in evidence-based practice have improved systems of care and patient health outcomes (Stevens, 2013). Evidence-based practice is intended to standardize healthcare practices to the latest and best science available in order to create clinical practice guidelines/recommendations to promote high-quality healthcare practices, minimize practice variations, and avoid unanticipated health outcomes. These guidelines and recommendations are systematically developed statements issued to assist the HCP and patient decisions about appropriate healthcare for specific clinical situations (Institute of Medicine, 1990). The successful implementation of these guidelines should improve the quality of care by decreasing inappropriate variation in practice and expediting the application of effective advances into everyday practice.

Guidelines are valuable tools in situations where the scientific evidence is sparse, where multiple therapies are available, or where uncertainty in terms of treatment options exists. The criteria and prerequisites for the development of guidelines/recommendations are: 1) a highly prevalent disease, 2) frequently used medical procedure, 3) current variations in practice, and 4) high associated costs (Fischer, Lange, Klose, Greiner, & Kraemer, 2016). They are particularly important for diseases leading to premature mortality, avoidable morbidity, or negative effects on health-related quality of life. Furthermore, the evidence should indicate that medical care can make a difference to outcomes (Eccles, Grimshaw, Shekelle, Schünemann, & Woolf, 2012).

Although it is widely recognized that evidence-based practice reduces morbidity, mortality, medical errors, and the variation of healthcare delivery, it is not implemented consistently by nurses and other clinicians in healthcare systems (Melnyk, Fineout-Overholt, Gallagher-Ford, & Kaplan, 2012). One of the most consistent findings in research pertaining to healthcare services is the gap between evidence and practice (Correa-de-Araujo, 2016; Fischer et al., 2016; Geerligs, Rankin, Shepherd, & Butow, 2018). A well-reported gap exists between clinical practice and much of the evidence available to HCPs (Correa-de-Araujo, 2016; Grimshaw, Eccles, Walker, & Thomas, 2002; Kahlke, McConnell, Wisener, & Eva, 2020).

The literature shows that HCP, including physicians and nurses, do not always follow issued evidence-based practice guidelines and recommendations (Gigli, Davis, Ervin, & Kahn, 2020; Lenzer, 2013; Melnyk, 2007). Barriers to implementation consist of knowledge deficit such as lack of awareness or lack of familiarity; attitudes such as lack of agreement, lack of self-efficacy, lack of outcome expectancy, differing social-cultural context, or the inertia of previous practice; and external barriers to the behavior such as its difficulty in use, cumbersomeness, or its cause of confusion (Baiardini, Braido, Bonini, Compalati, & Canonica, 2009; Cabana et al., 1999).

Despite information dissemination, numerous barriers were identified, beyond lack of knowledge/awareness of guidelines and HCP's knowledge acquisition, with studies showing that knowledge alone has a limited effect on changing behavior (Cabana et al., 1999; McGinty & Anderson, 2008; Melnyk, 2007; Pathman, Konrad, Freed, Freeman, & Koch, 1996; Pravikoff, Pierce, & Tanner, 2005). Experts agree that nurses can play a key role in building and implementing evidence-based practice (Correa-de-Araujo, 2016). How findings from evidence-based research are translated into effective nursing practices and policies considerably impacts

health outcomes, the improvement of health care systems, and the performance of individual and group providers (Stevens, 2013).

Nurses and infant safe sleep. Nursing is consistently known as the most trusted profession (Stone, 2019). Due to the trust the public has in nursing, and because of the number of nurses and frequent contact with the public, nurses are a critical component in the environment to influence the improvement of health and wellness (Borchardt, 2000; Montoya & Kozeliski, 2014). Through role-modeling health-promoting behaviors, and the nurses' inherent beliefs that the health-related action is warranted, a positive outcome could ensue.

Although the AAP has established recommendations for safe sleep practices to reduce sleep-related infant deaths, one of which is for HCPs to practice and role-model infant safe sleep, hospitalized infants have been observed in unsafe sleep situations (Macklin, Gittelman, Denny, Southworth, & Arnold, 2016). These professionals are advised by the AAP to endorse and educate parents about ISS (AAP Task Force on Sudden Infant Death Syndrome, 2016). Nurses are uniquely situated to educate, as well as model correct sleep positioning that directly impact infant care after discharge (Bartlow et al., 2016; McMullen et al., 2016). Yet, studies show that implementation of the AAP's infant safe sleep recommendations are not consistently being followed by HCPs and parents alike.

Numerous studies of nurses working with MB clients reveal poor compliance and inconsistent modeling and knowledge of AAP recommendations. Stastny et al. (2004) performed a cross-sectional survey-based study conducted among hospital newborn nursery staff (n = 96) and mothers of newborns (n = 579) at eight perinatal hospitals in Orange County, California. The purpose of the study was to assess newborn placement practices of the mother and nursery staff and their interrelationship in the hospital setting. Researchers visited the hospitals at random

times of the day over a 7-week period. At each visit, nursery staff completed a questionnaire on knowledge, procedures, and recommendations for infant sleep positioning. In addition, mothers completed a questionnaire on advice they had received regarding infant positioning, the positions they observed used by nursery staff, and in what position they placed their infants. Results showed that 68% of the staff typically placed infants in a side-lying position and 65% advised new mothers to place their infants either on their side or back, even though 72% knew that the back position was associated with lower incidence of SIDS. There were several reasons: 91% of the nursery staff preferred the side position due to concerns with aspiration; 41% of mothers reported that they received no advice on positioning their infants; and 63% observed their infants placed on their sides or prone. Mothers who observed nursery staff placing infants on their sides or prone were more likely to place their infants in these non-recommended positions (Stastny et al., 2004).

Bartlow et al. (2016) conducted an observational, quantitative descriptive study on well-baby postpartum nurseries in two Washington, DC, hospitals. Staff nurses were not informed of the purpose of observations, but the nursing unit directors were. A convenience sample (n = 66) of direct observations of infants in the postpartum nursery was used to collect data on the infants' positioning and crib environment. Observations were conducted specifically in the postpartum nursery where infants were monitored by registered nurses, rather than their mother or caretaker with no requests made for infants to be brought in for observation. Nurses' knowledge and attitudes were measured using an anonymous, self-administered questionnaire (n = 19), which was distributed within the postpartum units after observations had been concluded.

The study found that 34.8% of total observations did not meet the AAP guidelines regarding ISS position. Of the observations for sleep environment, 59.1% did not meet AAP

recommendations. The nurses' self-administered survey revealed that 100% of the nurses stated awareness of the AAP guidelines regarding ISS positioning, with 95% correctly identifying supine as the recommended position; 53% stated that they placed infants in the supine position 100% of the time with none reporting the use of the prone position; 89% of responding nurses stated they encouraged parents to use the supine position at home; and 79% indicated their discharge teaching included sleep position and AAP recommendations. Regarding the nurses' attitudes about SIDS, 74% of the responding nurses stated they believed infant positioning was associated with SIDS, while 26% indicated it was not or that they were unsure. Additionally, nurses were asked to rank nine factors that influenced their practice regarding infant sleep positioning. These factors included policy, research, clinical experience, personal preference, supervisor, parent's choice, co-workers, physician order, and personal experience with SIDS. Overall, the top three most influential factors chosen by the respondents were policy, research, and clinical experience: 56% of nurses ranked personal preference as a top-three factor and 25% of respondents stated that in their clinical experience, the supine position will increase risk of aspiration, cause the infant not to sleep well, and decrease comfort of the infant (Bartlow et al., 2016).

Macklin et al. (2016) reported on a QI intervention conducted in Ohio. On January 24, 2014, the Ohio State Chapter of AAP initiated the EASE (Education and Sleep Environment) Injury Prevention Collaborative with the goal of increasing observed safe sleep environments using crib audits of infants in children's hospitals throughout Ohio. Six Ohio children's hospitals without designated maternity centers or nurseries conducted QI interventions and evaluations. Baseline crib audit data were collected. A 2-hour interactive learning session on safe sleep evidence-based guidelines, local statistics, QI principles, and utilization of Plan-Do-Study-Act

cycles were provided to leadership teams within the institutions. The teams used a standardized data tool to collect information on the infant's age and sleep position/environment. Baseline data were collected, followed by weekly audits for the duration of the 12-month project. Teams were required to implement at least three Plan-Do-Study-Act cycles. Changes were calculated in safe sleep practices over time. From the participating hospitals, a total of 5,343 crib audits were reported by the team leaders during the 12-month collaborative; 87.8% (n = 4,692) of these were included in statistical analysis. Pre-intervention, the results showed n = 279 (32.6%) of n = 856 of sleeping infants were observed in AAP recommended position/environments and n = 110 (58.2%) of 189 ($p < .001$) at the project's conclusion. Additionally, parents/caregivers were asked about infant safe sleep education provided by staff members. The findings showed 117 (48.2%) of 243 families/caregivers reported that they had received education on safe sleep practices during their admission before the initial audit and 75.4% (46/61) (95% CI 14.76 to 39.76; $p < .001$) at the project's conclusion. Parents reported that direct safe sleep education by staff, particularly that done by nursing staff was the method most commonly reported (85.3%; Macklin et al., 2016).

A QI project by Frey, Hamp, and Orlov (2020) conducted at the University of Chicago Medicine Comer Children's Hospital aimed to modify healthcare provider' practices using a brief and focused educational intervention and to assess its effectiveness by comparing baseline and post-intervention adherence to ISS in the hospital setting. Crib audits and level of knowledge of ISS were obtained. The sample consisted of attending physicians, residents, and nurses working on the general pediatric wards. Five core ISS practices were identified to study: (1) infant placed supine, (2) infant alone, (3) infant in a flat crib, (4) no objects in the crib, and (5) infant clothed and covered in a manner that limits the risk of suffocation and overheating. The

sample size was *n* = 135. Pre-intervention knowledge scores showed that over 80% of providers were up-to-date on recommendations for sleep position, co-sleeping, and swaddling. However, results suggested uncertainty about the use of bumper pads and positioners/wedges for sleeping infants, with 78.5% of participants responding that bumper pads and 54.8% responding that positioners should never be used during sleep. Pre-intervention sleeping infant crib audits of *n* = 100 showed *n* = 87 (87%) were found supine, *n* = 86 (86%) were found alone, *n* = 94 (94%) had objects in the crib, *n* = 61 (61%) were over bundled, and *n* = 94 (94%) had an elevated (non-flat) incline. Post-intervention crib audits had statistically significant improvement in all areas, yet a large number of crib audits still showed that all five core ISS practices were still not adhered to 100% of the time (Frey et al., 2020).

Other studies conducted show that there is a significant knowledge gap in ISS recommendations among nurses working in MB units (Gelfer et al., 2013; Grazel, Phalen, & Polomano, 2010). While these numerous studies have been done on MB units, very few have been done on inpatient Pediatric Units.

Over 250,000 infants are admitted to the hospital each year (Newberry, 2019). These hospitalizations, defined as any admission through 12 months of age, after the birth admission (signifying Pediatric Units and not MB services), coincide with the time in which infant death occurs due to SIDS and SUID. These hospitalizations are times when inpatient nurses can be the most influential teachers and role models for parents caring for their infants beyond discharge and promoting healthy behaviors at home.

Hospital staff may not be aware of the current safe sleep recommendations, which is evidenced by the common hospital practices of elevating the head of bed, nesting the infant with blankets, and use of other positioning devices that conflict with AAP recommendations. In

addition, studies of nurses show that they do not see it as their role to teach ISS to parents/caregivers (Basora, Wani, & Caraballo, 2017; Rowe et al., 2016). Basora et al. (2017) surveyed nurses (n = 61) at a Children's Medical Center in Texas regarding their knowledge of their institution's infant safe sleep policy and practices in caring for hospitalized infants. Results showed only 40% of nurses reported prior training about infant sleep safety; 40% admitted placing infants to sleep in prone or side position; 88% reported using blankets for tight swaddling; 44% used loose blankets; 29% used hats; and 61% used positioners/pillows. Less than half reported providing routine education to caregivers about infant safe sleep. Most nurses felt that annual online training regarding infant safe sleep would be beneficial (Basora et al., 2017).

Shadman, Wald, Smith, and Coller (2016) conducted a quality improvement study aimed to increase adherence to safe sleep practices for infants admitted to a children's hospital general care unit between October 2013 and December 2014. After the creation of a hospital policy, a multidisciplinary team developed interventional strategies based on root cause analysis and implemented changes using iterative Plan–Do–Study–Act cycles. Nurse knowledge was assessed before and after education. Infant safe sleep practices were measured continuously with room audits during sleeping episodes. Caregiver home practices after discharge were assessed via structured questionnaires before and after intervention as well. Nurses' knowledge before the education intervention was measured (n = 289) and then again after (n = 315). Results showed that pre-education, 95.8% of nurses had knowledge of the AAP's recommendation for supine sleep position, yet 83.7% had knowledge of appropriate bundling, 76.1% knew to keep the bed flat, 72.7% knew to have no items in the crib, and only 30% had knowledge of reflux and sleep position (Shadman et al., 2016).

Sleutel et al. (2018) conducted a longitudinal quasi-experimental project that assessed ISS practices and knowledge on MB units at three hospitals before and after implementing a bundled intervention at each hospital. The sample at hospital #1 was MB nurses, and after the initial pilot, the sample was expanded to include all nurses providing care for infants. At hospital #2, nurses included MB, labor and delivery (L&D), Neonatal Intensive Care Unit (NICU), and pediatrics. At hospital #3, the sample included all maternity nurses, as they are cross-trained and work in all obstetrical areas. Analyses included descriptive statistics, chi-square, t-tests and coefficient alpha. Baseline data of RN knowledge and practices were collected by a Likert-type questionnaire, created by researchers, with items derived directly from AAP recommendations for safe sleep, which focused on RN knowledge/beliefs and practices related to ISS. Three nursing experts reviewed the items for consistency with current recommendations and for readability. The experts had certifications in MB care and/or expertise in item and questionnaire development and measurement. The RN questionnaire had two sections: (a) RN knowledge/beliefs regarding ISS practices (11 questions) and (b) RN self-reported practices and teaching of safe sleep (8 questions). Each questionnaire was unit specific to reflect the differences in settings. In order to collect baseline data on the infant crib and sleep environment, the researchers developed a sleep environment audit checklist tool derived from AAP recommendations. Out of 171 nurses invited to participate in the study, 132 completed the questionnaire. From n = 132, only 62 completed both pre- and post-questionnaires. Results showed that mean scores improved for all RN knowledge items, with 9 of the 11 improvements attaining statistical significance. Of the RN practice items, mean scores for two items stayed essentially unchanged: that of placing the infant supine and correct co-sleeping. The remaining six RN practice items improved, with four improvements obtaining statistical significance.

Regarding parents' knowledge and recall of ISS teaching, a total of 462 sleep environment audits and parent conversations at the three hospitals occurred with 234 audits/conversations at baseline and 228 after the intervention. Data showed that 28.6% of parents reported that no ISS teaching was performed, as opposed to 86.4% post-intervention. In addition, 65.6% of sleep environment audits revealed that the environment was safe pre-intervention as opposed to 95.5% post-intervention (Sleutel et al., 2018).

Nurses as role models for parents' practices of infant safe sleep. Nurses serve as role models. There are over 4 million nurses in the nation. Nursing has been rated the most trusted profession for the past 18 years (American Nurses Association [ANA], 2019; Gallup, 2020), nurses comprise the greatest number of constituents of HCPs and have the most direct contact with patients and their families. They are constantly observed in their work setting, acting as living examples and seen as a point of reference for health and health-promoting behaviors (Blake, Malik, Mo, & Pisano, 2011). Serving as a momentous influence of these behaviors to their patients, family members, and caretakers after discharge from a healthcare facility, it is paramount that nurses are implementing the most current, evidence-based practices.

Modeling of best ISS practices by all nurses is critical to increasing adherence to ISS recommendations (Gelfer et al., 2013). Several studies have shown that nurses role-modeling best ISS practices is a crucial component to educating, not only parents but also other nurses, therefore creating a perpetuating effect of ISS behaviors to parents. Sleep practices observed in the hospital environment are more likely to be followed and repeated by all involved in the infant's care (Gelfer et al., 2013). The usage of extra blankets, elevation of the head of the crib, and the use of other supplies to position the infant is often seen in the hospital (Rowe et al., 2016). However, this practice can be imitated by the infant's parent and poses a risk to the

infant's safe sleep environment. Modeling best practices at each encounter is a critical component of reinforcing safe sleep practices (Goodstein, Bell, & Krugman, 2015).

Although parents may be aware of basic ISS recommendations, studies find that they are often uncertain about what recommendations mean and what they look like in practice (Moon, Oden, Joyner, & Ajao, 2010). Unfortunately, data indicate that healthcare providers often model unsafe practices or simply fail to discuss safe sleep (Ajao, Oden, Joyner, & Moon, 2011; Eisenberg et al., 2015; Goodstein et al., 2015; Hauck et al., 2003; Mason, Ahlers-Schmidt, & Schunn et al., 2013; Shadman et al., 2016; Smith et al., 2010). These failures to model unsafe infant sleep practices can both further confuse parents and implicitly suggest that unsafe practices are acceptable.

ISS initiatives/policies in hospitals. As a way to address infant sleep-related deaths and SIDS, numerous interventional studies have been found in the literature pertaining to the implementation of an ISS initiative/policy. A study conducted by Heitmann et al. (2017) evaluated the impact of policy-based efforts to improve modeling of safe sleep practices by health care providers in hospital settings across Tennessee. A total of 71 hospitals were involved with the policies required to address staff training on AAP safe sleep recommendations, correct modeling of infant safe sleep practices, and parent education. Hospital data on training process and results of crib audits were compiled for analysis. The findings showed 91% of hospitals reported training their entire obstetrical, prenatal/postpartum, and pediatric team. These training methods included printed materials (91%), face-to-face training (72%), and/or video-based training (21%). Hospitals reported a similar distribution of training for parents with printed materials (97.7%), face-to-face training (83.7%), and/or video (16.3%). All hospitals reported educating at least 90% of families prior to infant discharge. Thirty-one hospitals (69%) reported

conducting crib audits at least quarterly. Across all of the hospitals, staff assessed the sleep environments of 640 infants during the first audit and 622 infants in the final audit. Hospitals reported statistically significant improvements in the number of infants found in unsafe sleep environments between the first and last audits. The comparison of initial and final hospital crib audits showed a 45.6% ($p \leq .001$) decrease in the number of infants who were found with any risk factors for unsafe sleep. Infants found asleep in a non-supine position decreased by 45.2% ($p = .031$), infants with a toy or object in the crib decreased by 53.4% ($p \leq .001$), and infants not sleeping in a crib decreased by 50% ($p = .03$). The overall observance of infants who were found with any risk factors for unsafe sleep decreased 45.6% ($p \leq .001$) as well. Overall, there were statistically significant improvements in the crib audits pre- and post-intervention (Heitman et al., 2017).

In order to address the high numbers of sleep-related infant death in Georgia, the Department of Public Health launched the Georgia Safe to Sleep Hospital Initiative, which provided birthing hospitals with information and educational materials on safe infant sleep to be distributed to families of newborns. A pre-initiative statewide survey was sent to assess maternal attitudes, behavior, and experiences of infant safe sleep in the home. The results showed that only 43.8% of Georgia mothers reported always placing their infant on the back to sleep, and 48.9% reported never sharing a sleep surface with their infants. Sleep-related infant deaths are the third leading cause of infant mortality in Georgia. Of the 158 sleep-related infant deaths that were reviewed in 2014, 82 (51.9%) occurred among infants who were not sleeping on their backs, 95 (60.1%) occurred in an adult bed, and 99 (62.7%) occurred while the infant was sharing a sleep surface with another person. The study conducted by Walcott et al. (2018) examined the knowledge and behaviors of a sample of Georgia parents after the implementation

of the initiative in birthing hospitals. The primary caretakers of all infants born in Georgia from August 2016 to October 2016 were asked to complete a web-based survey one-month post-discharge. The final sample (n = 420) was assessed for two measures of knowledge and four measures of infant sleep behaviors for sleep position and location. Ninety percent of respondents demonstrated knowledge of the correct recommended sleep position and 85% location. A logistic regression was conducted revealing that the received information in the hospital was significantly correlated with safe sleep behaviors and infant sleep habits tended to influence safe sleep practices. The findings of the study show that the implementation of a statewide hospital initiative was associated with high levels of parental knowledge and behavior and may have been successful in reducing the practice of bed sharing (Walcott et al., 2018).

As a follow-up to the Georgia Safe to Sleep Hospital Initiative, in October 2017, a freestanding tertiary-care pediatric facility partnered with the Department of Public Health to participate in the hospital-based initiative. It was hypothesized that pre-initiative compliance with safe sleep recommendations on the general pediatric floors would be low; however, there would be significant improvement after an educational initiative that included nursing education, availability of crib cards with safe sleep checklists, and use of a motivational tracking board to show ABC compliance. Leong et al. (2019) conducted an interventional study with pre- and post-safe sleep initiative crib audits on the two general pediatric inpatient units at this freestanding hospital.

The findings showed the crib environment was significantly safer post-intervention (37.8% vs. 3.2%, $p < .01$). There were statistically significant decreases in items deemed as unsafe found in the cribs post-intervention with clothing (22.6% to 8.9%, $p = .03$), stuffed toys (35.5% to 13.3%, $p < .01$), extra blankets (82.3% to 44.4%, $p < .01$), medical supplies not in use

(21% to 5.6%, $p < .01$), and other loose items (64.5% to 21.1%, $p < .01$). Overall ABC compliance significantly improved from 3.2% pre-intervention to 34.4% post-intervention ($p < .01$).

Breastfeeding, SIDS, and infant safe sleep. Breast milk is considered to be the best source of infant nutrition (Lessen & Kavanagh, 2015). Studies have shown that it contains bioactive agents that improve the function of the gastrointestinal tract and the immune system, as well as brain development (Martin, Ling, & Blackburn, 2016). Breast milk is widely recognized as a biological fluid required for optimal infant growth and development. Studies have further suggested that breast milk mitigates infant programming of late metabolic diseases, particularly protecting against obesity and Type 2 diabetes (Savino, Benetti, Liguori, Sorrenti, & Cordero Di Montezemolo, 2013).

It is well documented that breastfeeding provides numerous protective effects for an infant, including risk-reduction for SIDS (AAP Task Force on Sudden Infant Death Syndrome, 2016; Hauck et al., 2011; Horne et al., 2004; Thompson et al., 2017). Breastfed infants are more easily aroused from active sleep at 2–3 months of age than formula-fed infants. This age, coinciding with the peak incidence of SIDS, may contribute to its protective mechanism (Horne et al., 2004). Breastfeeding that continues into the second to fourth month of life provide increased risk reduction of SIDS for the infant. Although any amount for the first month of life may still offer protective benefits, studies show that peak protective effects occur with breastfeeding beyond 2 months of life.

Thompson et al. (2017) performed a meta-analysis of individual-level data from 8 case-control studies to assess the associations between breastfeeding duration and SIDS. A total of 2,267 SIDS cases and 6,837 control infants were included. The univariable effects of any

breastfeeding, categorizing duration showed that those who breastfed for < 2 months incurred a protective effect (OR: 0.61, 95% CI: 0.54–0.69) and that those breastfeeding for 2 to 4 months had a greater protective effect (OR: 0.26, 95% CI: 0.22–0.30). Breastfeeding duration beyond 4 months provided further small increases in protection (4–6 months: OR: 0.18, 95% CI: 0.14–0.23; 6+ months: OR: 0.13, 95% CI: 0.10–0.18). The multivariable pooled analysis, with all confounders controlled for, found ongoing protective effects of any breastfeeding beyond 2 months (2–4 months: aOR: 0.60, 95% CI: 0.44–0.82; 4–6 months: aOR: 0.40, 95% CI: 0.26–0.63; and 6+ months: aOR: 0.36, 95% CI: 0.22–0.61). However, breastfeeding for 0 to 2 months did not have a statistically significant protective effect (aOR: 0.91, 95% CI: 0.68–1.21).

The stratified and pooled analysis for the univariable effects of exclusive breastfeeding, categorizing the duration of exclusive breastfeeding, showed that those who exclusively breastfed for < 2 months incurred a protective effect (OR: 0.61 95% CI: 0.53–0.71) and those breastfeeding 2 to 4 months had a greater protective effect (OR: 0.25, 95% CI: 0.20–0.30). Exclusive breastfeeding for > 4 months provided a further increase in protection (OR: 0.16, 95% CI: 0.12–0.2; Thompson et al., 2017).

Studies found in the literature regarding the practices of nurses encouraging/supporting breastfeeding are predominantly focused on nurses in MB units pertaining to immediate post-partum needs. A study conducted by Wedding, Baker and Auld (2011) showed that there is a difference in knowledge, practices, and beliefs in Baby-Friendly/Baby-Friendly Hospital Initiative (BF/BFHI) hospitals compared to non-BF/BFHI hospitals, with MB nurses at non-BF/BFHI referring to breast milk and formula as equal, and even though these nurses considered breastfeeding the “gold standard,” they allowed frequent supplementation with formula, regardless of medical need (Wedding et al., 2011). Another study conducted on 302 MB nurses

found that 72% assisted with breastfeeding techniques, 68.2% counseled patients on infant-feeding methods, 61.3% counseled patients prenatally, 60.3% assisted with lactation problems, and 2% selected other (Alakaam et al., 2018). The Sleutel et al. (2018) quasi-experimental ISS initiative study looked at inpatient MB as well as pediatric nurses. The findings showed (n = 62) inpatient MB and pediatric nurses' beliefs in breastfeeding, when asked about its importance for safe sleep factors, a mean score pre-intervention as 4.41 (1 = *not at all important* to 5 = *very important*, SD = 1.06). Although the Sleutel et al. (2018) study looked at breastfeeding in relation to AAP recommendations and the nurses' belief of importance to infant safe sleep practices, it did not examine the actual practice of encouraging/supporting breastfeeding.

An A-level recommendation by the AAP states the safest place for an infant to sleep is on a separate sleep surface designed for infants close to the parents' bed. The practice of sharing a sleep surface poses a greater risk for a sleep-related death, with statistics showing that infants were found with overlay that occurred most often in an adult bed (71%) with being overlaid by the mother (47%). Although this recommendation is made by the AAP, the Academy of Breastfeeding Medicine (ABM) states that bedsharing may only be a risk in hazardous circumstances (Blair et al., 2020). The ABM states that bedsharing promotes breastfeeding initiation, duration, and exclusivity. "Medical and public health organizations in some countries recommend against bedsharing, citing concerns over increased risk of sleep-related infant death, bedsharing may only be a risk in hazardous circumstances as demonstrated by epidemiological study" (Blair et al., 2020, p. 1). The ABM provides clear guidelines and outlines that these recommendations apply to mother-baby dyad who have initiated breastfeeding and are in home settings and are not intended for use in hospitals or birth centers. The guidelines, presented as *Elements of Safe Bedsharing Advice, In Order of Importance,* include never sleep with infants on

a sofa, armchair, or unsuitable surface, including a pillow; place infants to sleep away from any person impaired by alcohol or drugs; place infants supine for sleep; the bed should be away from walls and furniture to prevent wedging of the infant's head or body; and the surface of the bed should be firm, just as with a crib and without thick covers, pillows, or other objects that could cause accidental head covering and asphyxiation (Blair et al., 2020). While it appears that many of the A-level AAP recommendations are included in the ABM *Elements of Safe Bedsharing Advice*, the AAP does not recommend sharing a sleep surface.

Discharge teaching and planning. As patients are approaching their return to home from a hospital admission, it is one of the responsibilities of the healthcare team to prepare them with the knowledge, skills, and therapeutic regimen to continue care, prevent injury and readmission, and to teach health-promoting behaviors. Discharge teaching in pediatrics is the act of educating (at time of discharge) in which information, knowledge, skills, and anticipatory guidance are given to the parents to assume care as the patient transitions from hospital to home. Discharge planning, a process that begins upon admission and carries through to discharge, is a means to ensure that comprehensive discharge teaching is appropriate and effective.

Quality discharge teaching and planning have emerged as a priority for improving patient outcomes as well as reducing costs of care (Weiss et al., 2017). Although discharge preparation is a multidisciplinary effort, nursing staff primarily have this responsibility. Studies show that when parents of hospitalized pediatric patients report feeling unprepared for discharge, they have difficulty transitioning from hospital to home and managing their child's care needs (Lerret & Weiss, 2011; Weiss et al., 2008), leading to problems that may result in returning to the hospital for an emergency department visit or readmission (Weiss et al., 2017).

A literature review was conducted by Andreotta et al. (2013) to examine the effect of hands-on safe sleep education with parents of infants discharged from an inpatient setting. The review produced several studies that showed inconsistencies in the frequency, amount of, and method of teaching (Andreotta, Hill, Eley, Vincent, & Moore, 2013). The hospital setting is the first place where new parents are exposed to and taught appropriate infant care with greater trust found in the healthcare providers who care for their infants (Shaefer, Herman, Frank, Adkins, & Terhaar, 2010). Role modeling and demonstration have been significantly more impactful on parental safe sleep practices than discussion and/or reading alone (Moon & Omron, 2002). Moreover, approximately 70% of parents stated they received information from nursing staff on infant safe sleep (Moon & Ormon, 2002). There is significant value in nurses' behaviors and teaching modalities for parental safe sleep practices (Andreotta et al., 2013). The review by Andreotta et al. (2013) found that role-modeling behaviors and educational strategies by nurses were underscored. These various methods of teaching can potentially improve parental understanding of the rationale behind safe sleep as well as parental compliance with practices.

The literature shows that infants in NICU have discharge planning beginning at the time of NICU admission. The promotion of family involvement in the infant's care, communicating, increasing parental understanding of their infant's medical issues, along with offering anticipatory guidance, all help to decrease parental stress and anxiety and facilitate safe transition to home (Jefferies, 2014). Ongoing parent education at the bedside is essential to promote these infant transitions to the home environment in a safe and supportive manner.

What nurses do to prepare parents of infants for hospital discharge has an impact not only at the time of hospital discharge but also in the post-discharge period (Jefferies, 2014). Recognizing the impact of discharge teaching on discharge-related outcomes for the infant and

parents provide evidence to support vested effort and resources to prepare inpatient pediatric nurses to perform high-quality discharge teaching, including teaching of ISS practices as health-promoting behaviors.

Summary

This literature review illustrates the lack of adherence to evidence-based practice guidelines and recommendations, and the lack of uniformity of ISS knowledge and practices seen in HCPs. Although the AAP recommends that HCPs, staff in newborn nurseries and NICUs, and child care providers should endorse, model, and implement the SIDS risk-reduction recommendations from birth, studies show these are not consistently being done. MB nurses, in particular, have been a more heavily concentrated population of study due to their focus on new mothers and infants in their first few days of life, yet very few studies have been done with a focus on inpatient pediatric nurses who may care for infants in their practice.

With this noted gap in the literature, the focus of this study was to examine the knowledge, attitudes, beliefs, and ISS practices of inpatient pediatric nurses on a national level with a representative sample of nurses from all states. Through use of an electronic survey, the members of a pediatric organization who responded were queried. Are there existing underlying characteristics that may predict how nurses teach and implement behaviors that promote safe sleep? Do inpatient pediatric nurses believe the recommendations themselves and apply them in their own lives and therefore would be advocates to promote these behaviors? Throughout the hospital stay, do inpatient pediatric nurses provide education on health-promoting behaviors of ISS practices for parents? This study looked to address these questions to gain a deeper understanding of ISS and the inpatient pediatric nurse to contribute to the overall reduction and prevention of SUID events.

CHAPTER THREE: METHODS

The preceding chapters introduced the subject to be investigated, the need for and purpose of the study, significance of the study, definitions of the variables, review of relevant literature, and a description of the theoretical framework in its application to the study. The purpose of this study was to examine inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices in providing care to infants during hospitalization in the acute care setting. This study investigated the existence of relationships among personal and work characteristics, academic degrees, years in practice, and acceptance and belief of the scientific evidence used to establish infant sleep recommendations by the AAP. Chapter three introduces the research design, methods, sampling plan, measures and procedures, hypotheses tested, followed by human subject considerations and analyses.

Research Design

A quantitative, descriptive study with a qualitative component was done via web-based survey. Concurrent qualitative and quantitative data collection was conducted by incorporating open-ended questions with comment boxes into the tool used for the study. The rationale for this approach was that the qualitative data would add depth to the quantitative findings and thus provide a more comprehensive understanding of inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of ISS than either approach alone (Creswell, 2014; Morgan, 2007).

Since few studies have been done and little is known about this topic relating to inpatient pediatric nurses, this design was believed to increase the depth and breadth of understanding inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of ISS. In addition, this design helped to illuminate various nuances that existed among inpatient pediatric nurses' acceptance and beliefs about the ISS recommendations issued by the AAP.

A quantitative descriptive-correlational study with a qualitative component was conducted at the same time. Numeric data and open-text field data from the survey were analyzed. Analyses of the qualitative and quantitative data produced a better understanding of inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices in providing care to infants during hospitalization in the acute care setting. The collection of both quantitative and qualitative data occurred through the use of a web-based, online survey.

Sampling

The researcher recruited pediatric nurses from a national pediatric nursing organization. This study, through electronic recruitment, used the entire membership of a national pediatric nursing organization who were pediatric nurses from all 50 states, serving as a national representative sample. From this population of members, a convenience sample was derived of those members who responded and then were stratified to seek out pediatric nurses who were RNs and worked with infants in a pediatric (non-MB unit), inpatient, hospital setting.

The national pediatric nursing organization used is called the Society of Pediatric Nurses (SPN), which is considered "the premier pediatric society" and represents over 3,600 pediatric nurses and 28 specializations (SPN, n.d., para. 5). Its inception in the mid-1980s was based on the idea of establishing a national pediatric specialty organization, following a conference in 1990. SPN founding members established the framework for the society, and it still continues today (SPN, n.d.).

Through the use of the SPN website, a *Request to Conduct Research* was available to both members and non-members. An application provided by SPN was completed and assigned to a review panel of experts. A blind review process occurred with acceptance granted. The online survey, created using Qualtrics, was sent electronically to the entire membership of SPN,

who were pediatric nurses from all 50 states, serving as a national representative sample. From this population of members, a convenience sample was derived of those members who responded and was then stratified to seek out those who met the inclusion criteria.

Sample size with power. To yield accurate and valid statistical results without incurring a Type I error, adequate sample size was needed. G*Power software was used to conduct an a priori power analysis, using an effect size of .3, a significance level of .05, and a power level of .8. The analysis yielded an $n = 196$.

Quantitative component

The first component was a cross-sectional quantitative, correlational, and comparative descriptive study. These methods and measures allowed for the examination of inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices in providing care to infants during hospitalization in the acute care setting. In addition, looking through the lens of Theory of Planned Behavior, an analysis was performed to find the existence of relationships among inpatient pediatric nurses' ISS knowledge, attitudes, behavioral beliefs, subjective norms, perceived behavioral control, level of perceived control, and confidence over ISS practices, and personal characteristics that may influence their infant safe sleep practices.

Qualitative component

The second component was a qualitative component from narrative responses to open-text field questions. Qualitative data were obtained from participants' responses to open-ended questions to gain more depth of explanation of attitude and behaviors of ISS practices "in their own words" using content analysis and constant comparison. This methodology is best when seeking to provide only accurate description and interpretation (Speziale & Carpenter, 2007).

Data Collection

Data collection was obtained using an online survey, created using Qualtrics, comprised of multiple-select, true/false, yes/no, visual analog scales (VAS), 5-point Likert-type scale questions (quantitative), and open-text fields (qualitative) to a national sample of nurses, seeking out those who provided care to infants, up to 12 months of age, in the inpatient pediatric setting. Distribution of the survey occurred electronically via email from SPN. Demographic quantitative descriptive data analysis using SPSS25, and thematic analysis using constant comparison method was performed on qualitative survey responses.

All responses were collected anonymously, with no identifiers retained or recorded. Each invitation to participate had information about the study, estimated time of duration to complete the survey, and an option to be eligible for a $250 Amazon e-gift card drawing. This large incentive was chosen to foster an adequate return. Subjects were informed that their participation was voluntary and responses were anonymous. Information regarding the study was presented at the top of the questionnaire with a required answer regarding consent in order to proceed. If the participant consented, the survey questions of the study were available to accept responses. If consent was not granted, the survey closed. The Dillman, Smyth, and Christian (2008) method of distribution was used to meet the minimum number of responses. This approach relies on personalized, repeated contact to boost response rates, which can be used through online surveys. The methods included (1) an introductory email informing potential respondent of the upcoming survey, (2) an email with a personalized survey link, and (3) two reminder emails sent at approximately weeks two and four of initial distribution (Dillman et al., 2008). Demographic questions were asked with responses collected, and further analysis using independent-samples t-

tests and one-way between groups ANOVA were performed to look for associations between the demographics and the defined variables.

To incentivize potential subjects, a $250 Amazon e-gift card was offered, in the form of a random drawing. Eligibility was dependent upon completion of the entire survey. One eligible participant was randomly selected out of those who voluntarily included their email address for follow-up on the raffle results. This information was technically de-identified from the response set of answers to the survey questions. Participants, upon completion of the survey, were automatically directed to a link that opened a Google Form in which their email address was requested and then manually typed in by the respondent, if they chose to be entered into the raffle. All potential participants were informed that any email addresses collected for the raffle were separate from their survey responses and there was no way of pairing their completed survey to the email address provided.

Measurements

One instrument, titled *Infant Sleep Practices* (*ISP*; Appendix B*)* tool, was used for this study to gather and measure the various quantitative data as well as the narrative data of the qualitative component of the study. The estimated time for completion of the survey was approximately 5-10 minutes. All survey questions were written in English. The *ISP* tool was based on select items from two tools that have been used to assess ISS practices in nursing professionals as well as additional questions (Table 3). For the purpose of this study, a modified combination of select items from these two established tools was created to serve as one tool that demonstrated more congruence with obtaining inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices on ISS.

Peds Safe Sleep Questionnaire. The first tool in which select items were taken from and used to create the *ISP* tool was based on a tool developed by Sleutel et al. (2018) used to assess ISS knowledge, beliefs, and practices in various units that provided care to infants in three different hospitals in Texas. An electronic correspondence was sent to the researcher and developer of the tool, with permission granted for its use in this study (Appendix C). In the study by Sleutel et al. (2018), four different questionnaires were used, based on the specific unit where the tool was distributed. Registered nurses from units of MB, Labor & Delivery (L&D), and Neonatal Intensive Care Unit (NICU) and Pediatrics were used in the sample. Therefore, each unit had its own questionnaire, as questions were adapted to reflect differences in those four settings.

The tool selected from the Sleutel et al. (2018) study for partial adaptation for this current study is called the *Peds Safe Sleep Questionnaire*. It was a tool created to collect baseline data on inpatient pediatric RN knowledge and practices with items derived directly from the AAP recommendations for safe sleep and focused on RN knowledge/beliefs and practices related to ISS. The items of the *Peds Safe Sleep Questionnaire* were reviewed by three nursing experts for consistency with current AAP recommendations and for item readability, with these experts having certifications in MB care and/or expertise in item and questionnaire development and measurement (Sleutel et al., 2018).

Table 3

Development of Infant Sleep Practices (ISP) Tool

Name	**Year/ Author**	**Measures**	**Population**	**Items**	**Total # of Non-demographic Items Used, Identity of Items, Corresponding Item # in *ISP* Tool**
Peds Safe Sleep Questionnaire	2018, Sleutel, et al.	Knowledge, beliefs, attitudes & practices of ISS	Inpatient Pediatric Nurses	25 items: 19 Likert Scale, 6 Demographic	• 12 items in total • Items #1-4, 6, 8, 9, 11, 14-16,18 in Sleutel et al. (2018) tool • Modifications made for applicability to study • Corresponds to item #8 (as subparts), #9 (as subparts), #10 (as subparts)
Nurse Survey Instrument	2016, Hodges	Knowledge beliefs, attitudes & practices of ISS	Obstetrical Nurses (LPN/LVN & RN), NP, CNM CNS	29 items: 13 Demographic 12 Multiple Choice & Y/N, 4 Multiple Selection	• 5 items in total • Item #10-13, 14e in Hodges (2015) tool • Modifications made for applicability to study • Corresponds to item #2-7, and #13

The *Peds Safe Sleep Questionnaire* is a 25-item questionnaire that consists of two parts. The first section contains 11 Likert-type questions to assess RN attitudes/beliefs regarding safe sleep practices (items 1-11) and 8 Likert-type questions to gather RN self-reported practices and teaching of ISS actions (items 12-19). Certain items from this section were selected, modified, and added, based on applicability, to the *ISP* tool of the current study (Table 3). The second section of the *Peds Safe Sleep Questionnaire* contains 6 demographic questions (items 20–25). This section also had certain items (21, 22) selected, modified, and added to the *ISP* tool, as the populations that Sleutel et al. (2018) had studied were all working in a hospital setting. The current study's population used a convenience sample from a national pediatric nurses'

organization and therefore specific items to gather accurate demographic information such as work and personal characteristics were needed.

In order to assess internal consistency reliability, coefficient alpha was used for each administration of the Sleutel et al. (2018) tool at the two larger hospitals and the combined results. At hospital #1, pre-post alphas were .76 and .85; while corresponding alphas at hospital #2 was .72 and .83. Hospital #3 was omitted from the analyses due to a small sample. A coefficient alpha of all three hospitals combined had been calculated and showed pre-post alphas of .77 and .82. Having the items based on well-established safe sleep recommendations provided a degree of validity related to content.

Nurse survey instrument. A cross-sectional survey study on infant safe sleep practices of obstetric physicians, obstetrical nurses, nurse practitioners (NP), certified nurse midwives (CNM) and clinical nurse specialists (CNS) was conducted in Ohio by Hodges (2016). This study looked to ascertain the knowledge, beliefs, attitudes, and practices of this MB healthcare professional population in Ohio, where the state is ranked 11th in the US for its overall infant mortality rate and has the third highest mortality rate in the country for African American infants (Hodges, 2016; Hodges, Anderson, McKenzie, & Katz, 2018). The tool, *Nurse Survey Instrument*, was developed by Hodges based on a review of the scientific literature and with input from two infant safe sleep experts at the Ohio Department of Health. With permission, the researcher included survey items from a previously administered survey on this topic (unpublished) developed by Rachel Moon and colleagues (Hodges, 2016).

The survey was reviewed for content validity by five members of the Ohio Injury Prevention Partnership's infant safe sleep subcommittee prior to pretesting. Infant safe sleep is a

priority topic for this group and the subcommittee includes more than 85 individuals working on this topic throughout the state.

The study conducted by Hodges (2016) surveyed both physicians and nurses. Therefore, the researcher developed two instruments to administer to each of the populations to be studied. An electronic correspondence was sent to Hodges, seeking permission for use of the nurse specific survey tool in this study (Appendix D). Permission was granted for its modification and use. For this current study, components and items of the Hodges' *Nurse Survey Instrument* were selected and/or modified for use in creating the *ISP* tool.

The *Nurse Survey Instrument* consists of 29 questions in which MB nurses, including RNs, CNMs, NPs, and CNSs, were asked about the following: their knowledge of risk factors for SIDS and infant sleep-related death, their knowledge of then current AAP (2011) infant safe sleep recommendations, and their attitudes and behaviors related to providing infant safe sleep education to mothers.

Knowledge. Seven questions were used to assess participants' knowledge of risk factors for SIDS/infant sleep-related death and the AAP's 2011 infant safe sleep recommendations. Three multiple-select questions gauged their awareness of infant safe sleep recommendations related to infant sleep positioning and environment, and four true/false questions evaluated respondents' knowledge of risk factors for SIDS. For the current study, all knowledge items from the *Nurse Survey Instrument* were selected, modified, and added, based on applicability, to the *ISP* tool of the current study (Table 3).

Attitudes. The nurses' attitudes, outcome expectations, and self-efficacy related to providing SIDS and infant safe sleep education were categorized using five statements measured on a 5-point Likert scale (*strongly agree* to *strongly disagree*). For the current study, item 14e

from the *Nurse Survey Instrument* was selected, modified, and added, based on applicability, to the *ISP* tool for the current study.

Demographics. Participants' demographic characteristics were the focus of the last section of the survey. Items #20-28 included: a) the number of years practicing; b) ethnicity; c) race; d) gender; e) age; f) location of principal place of employment; g) the racial and ethnic composition of their patient population (by estimated percent); h) the estimated percentage of their patients that have specific types of medical insurance (private, public, government/military, or not insured); and i) if participants had ever received formal training on SIDS/infant safe sleep, and if so, whether they have received such training within the past four years, as the AAP released its revised policy statement on SIDS/infant safe sleep four years prior to the launch of the survey.

For the current study, the demographic portion of the *Nurse Survey Instrument* also has specific items (20-23) selected, modified, and added to the *ISP* tool (Table 10), as the populations that Hodges (2016) had studied were all working in MB services and had diversified licenses and scopes of practice that differed from the current study. The current study's population was a convenience sample from a national pediatric nurses' organization and therefore, specific items to gather accurate demographic information, such as work and personal characteristics, were needed.

Infant sleep practices tool. The tool used in the current study was named the *Infant Sleep Practices (ISP)* tool (Appendix B). It was developed by the researcher by selecting, modifying, and combining select items (Table 3) from those two established instruments, the *Peds Safe Sleep Questionnaire* and the *Nurse Survey Instrument,* used in prior studies to measure MB and pediatric nurses' ISS knowledge, attitudes, beliefs, and practices. In addition to the

items that were selected, modified, and combined from the *Peds Safe Sleep Questionnaire* and the *Nurse Survey Instrument,* new questions were developed and used in the current study's tool to assess and measure other variables that have not been studied before. These variables were 1) inpatient pediatric nurses' level of control over their infant sleep practices (*perceived behavioral control*) – item 12, 2) inpatient pediatric nurses' level of confidence in their ISS practices (based on the AAP safe infant sleep recommendations) as an HCP – item 13 (*perceived behavioral control*), 3) inpatient pediatric nurses' perceived self-recognition as a role model of infant sleep practices to parents/caregivers in their practice – items 14a (*behavioral belief*), 4) inpatient pediatric nurses' perceived self-identification as a role model of infant sleep practices to HCP colleagues in their practice – item 14b (*behavioral belief),* 5) inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift at their place of work – 15 (*behavioral belief),* 6) inpatient pediatric nurses' HCP colleagues and their practices – item 10 (*normative belief*), 7) presence of ISS initiatives/policies at inpatient pediatric nurses' unit and/or workplace (*control belief*) – item 30, and 8) influence of the AAP, colleagues' practices and parents'/parents' satisfaction on inpatient pediatric nurses' ISS practices – items 11c-h (*subjective norm*).

Variables specified: Instrument items.

Descriptive variables.

- Personal and work characteristics: Items 19-29, 31, 32
    - These items obtained information on the subjects regarding age, gender, ethnicity, academic degree, number of years in practice, area of practice, unit most commonly working on, and parental status.

- Presence of ISS initiative/policy on unit where the inpatient pediatric nurse works: Item 30

Aggregate measures.

- Inpatient pediatric nurses' knowledge of current AAP ISS recommendations (*actual behavioral control*): Items 2-7
- Inpatient pediatric nurses' attitudes towards AAP ISS practices (*attitudes*): Item 11a, 11b
- Inpatient pediatric nurses' beliefs on AAP ISS practices (*behavioral beliefs*): Items 8a-g, 16
- Inpatient pediatric nurses' belief/self-recognize as role model to parents/HCP colleague (*behavioral beliefs*): Item 14a, 14b
- Inpatient pediatric nurses' belief sleep-related/SIDS event could occur (*behavioral beliefs*): Item 15
- Infant sleep practices of HCP colleagues (*normative beliefs*): Item 10a-h, 17
- Inpatient pediatric nurses' infant sleep practices in relation to AAP, HCP colleagues and parents (*subjective norm)*: Items 11c-h
- Infant sleep practices (*Inpatient pediatric nurses' behavior*): Items 9a-h, 18
- Confidence and control over ISS practices (*perceived behavioral control)*: Items 12, 13
- Infant Safe Sleep Initiative/Policy (*control belief*): Item 30

Following the constructs of Theory of Planned Behavior, the *ISP* tool focused on examining inpatient pediatric nurses' (a) knowledge of AAP recommendations on infant safe sleep; (b) attitude and beliefs towards AAP recommendations; (c) normative beliefs of

colleagues and their infant sleep practices; (d) subjective norm in which the level of AAP, colleagues, and parents/parents' satisfaction influence inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices; and (e) perceived behavioral control about inpatient pediatric nurses' confidence related to using ISS practices. In the latter portion of the questionnaire, participants were asked to provide information about work, personal characteristics, and background; and qualitative questions were asked with open-text fields provided to gain further understanding (Appendix A).

Survey methodology, the study of item order, response rates, and accuracy of assessment of surveys, is done to optimize engagement and produce appropriate size returns. Dillman, as one of the most influential and widely cited researchers in survey methodology (Czaja & Blair, 2005), recommends placing demographic questions pertaining to personal characteristics at the end of the survey due to the fact that these questions are not interesting, nor do they connect the respondent to the beginning of the survey (Dillman, 2000). Furthermore, he indicates that, if the survey looks like a routine form and does not seem to be applicable to the respondent, the intended participant may not complete the survey (Dillman, 2000).

Studies show that Colton and Covert (2007) reiterated the advice of Dillman, suggesting that if demographics are placed at the beginning of the survey, the flow will be interrupted, causing the participant to become less engaged, and ultimately decrease response rate. Breakwell et al. (2006) asserted that it is a growing practice to place demographic questions at the end because they are easy to answer. They believe that participants tire toward the end of a questionnaire and having these effortless questions at the end can be a relief.

Knowledge items. One of the variables examined was the inpatient pediatric nurses' knowledge of the current AAP (2016) Safe Infant Sleep Recommendations. This variable

corresponded to items 2-7 on the *ISP* tool (Appendix B). To assess their knowledge, each of the six knowledge questions were scored dichotomously as either correct = 1 or incorrect = 0, based on the desired responses as illustrated in Appendix B. Responses of I don't know = 0 and was scored as incorrect. For the multiple-select question on safest sleep position, item 2, participants were given the instruction, "mark all that apply." If respondents identified the one correct recommended sleep position included out of the other incorrect choices, the question was scored as correct. For item 3, respondents were asked about their knowledge on a safe sleeping environment based on the 2016 AAP Safe Infant Sleep Recommendations. If respondents identified at least one of the three recommended sleep environments included out of the other incorrect choices and did not choose any unsafe sleep environments, the question was scored as correct. Similarly, for item 4 on safe items to include in an infant's sleep environment, the question was marked correct if the participant selected one correct and did not select any unsafe items as being acceptable, even if they did not correctly identify the remaining two correct answers. Items 5 through 7 were presented as True/False style questions and also had dichotomous scoring of correct = 0 and incorrect = 1, based on the desired response selected. The sum of all six knowledge questions answered by each respondent yielded a total knowledge score, ranging from 0 being the lowest score attainable and 6 being the highest, indicating full knowledge (Table 4, 10). The higher the score achieved by the respondent, the greater the knowledge.

Table 4 *Measure: Knowledge Items*
Multiple Select Items
2. Based on the current infant sleep recommendations from the American Academy of Pediatrics (AAP), which of the following is considered the safest sleep position for most infants? (Mark all that apply)
3. Based on the current infant sleep recommendations from the AAP, which of the following environments are recommended for infant sleep? (Mark all that apply)
4. Based on the current recommendations of the AAP, which of the following items are acceptable to include in an infant's sleep environment? (Mark all that apply)
True/False Items
5. The risk of Sudden Unexpected Infant Death (SUID), such as Sudden Infant Death Syndrome (SIDS), can be reduced.
6. Infants are more likely to aspirate when placed on their back to sleep.
7. It is safe for a parent and infant to share a sleep surface.

Attitude items. The next variable the researcher examined was inpatient pediatric nurses' attitude toward practices of ISS. This variable corresponded to items 11a and 11b on the *ISP* tool (Appendix B), with each as 5-point Likert-type scale question scored as *Never* = 1, *Minimally* = 2, *Somewhat* = 3, *Moderately* = 4 and, *Always* = 5. A sum of the scores was performed to measure inpatient pediatric nurses' attitudes toward ISS practices with a minimum score of 2 and a maximum of 10 attainable (Table 5, 10). The higher the sum of the scores indicated a more positive attitude.

Table 5 *Measure: Attitude Items*
5-point Likert-scale: *Never* = 1, *Minimally* = 2, *Somewhat* = 3, *Moderately* = 4, *Always* = 5
11. How you feel about these Infant sleep practices in your role as a healthcare professional:
11a. I feel it's necessary to practice infant safe sleep
11b. I feel it's satisfying to practice infant safe sleep

Belief items. Another variable the researcher examined was inpatient pediatric nurses' beliefs toward ISS practices, the 2016 AAP Safe Infant Sleep recommendations, and important

referents' influence on their infant sleep practices. This variable corresponded to items 8a-g, 11c-h, 14-17 (Appendix B). Item 8 measured the amount of belief in the 2016 AAP Safe Infant Sleep recommendations (*behavioral beliefs*) scored as *Not at all important* = 1, *Minimally important* = 2, *Somewhat important* = 3, *Moderately important* = 4 and, *Very important* = 5. A sum of the scores was performed to measure inpatient pediatric nurses' beliefs towards ISS practices with a minimum of 7 and a maximum score 35 (Table 6, 10), with higher scores being associated with greater beliefs. Items 11c-h measured the amount of influence the AAP, colleagues, and parents of the infants (dependent on parent satisfaction rating) have on inpatient pediatric nurses' infant sleep practices (*subjective norm*) scored as *Never* = 1, *Minimally* = 2, *Somewhat* = 3, *Moderately* = 4, and *Always* = 5. Three separate sum scores were calculated with pairings of 11c and 11f, 11d and 11g, and 11e and 11h. As items 11f-h were written in the negative, reverse coding was performed. The sum of the scores was conducted with each having a minimum score of 2 and a maximum score of 10 with a higher sum of scores indicating a greater influence on the inpatient pediatric nurses' infant sleep practices. Item 14 measured the belief of inpatient pediatric nurses' self-recognition as a role model of infant sleep practices to parents (14a) and to colleagues (14b) using VAS ranging from 0 to 100. These scores were combined to obtain a score from 0 to 200. The higher the number selected, the greater the belief of inpatient pediatric nurses' self-recognition as a role model. Item 15, using a VAS ranging from 0 to 100, measured the inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift on their unit. The higher the number selected, the greater their belief that these deaths could occur. Item 16 was a question seeking to gather, in the respondents' own words through the use of open-field text, inpatient pediatric nurses' belief and level of trust in the credibility of the 2016 AAP infant safe sleep recommendations. Item 17 was a question seeking to gather, in the respondents' own

words through the use of open-field text, the degree of influence, if any, parent satisfaction rating had on inpatient pediatric nurses' infant sleep practices.

Table 6

Measures: Belief Items

Behavioral Beliefs: How important do you REALLY feel these factors are for infant safe sleep? **5-point Likert-scale:** *Not at all important* = 1, *Minimally important* = 2, *Somewhat important* = 3, *Moderately important* = 4, and *Very important* = 5
8a. Infant's sleep position as supine (back) position
8b. Infant's sleep environment (i.e., firm surface, no pillows/blankets, no toys)
8c. Infant sharing a sleep surface (i.e., bed sharing, chair sharing)
8d. Breastfeeding
8e. Amount/layers of clothes infant is wearing while sleeping
8f. Offering the infant a pacifier at nap or bedtime
8g. Nurses role modeling safe infant sleep practices in the hospital
Subjective Norm: How do you feel about infant sleep practices related to your role as HCP? *Not at all important* = 1, *Minimally important* = 2, *Somewhat important* = 3, *Moderately important* = 4, and *Very important* = 5
11c. I feel the AAP influences my infant sleep practices
11d. I feel my colleagues influence my infant sleep practices
11e. I feel my patient's parents' satisfaction influence my infant sleep practices
11f. I feel my infant sleep practices differ from the AAP, but I practice what I feel is best for the infant
11g. I feel my infant sleep practices differ from my colleagues, but I practice what I feel is best for the infant
11h. I feel my infant sleep practices differ from my patient's parents, but I practice what I feel is best for the infant
Self-Recognition Beliefs: Using the below slider, please indicate your LEVEL OF SELF-RECOGNITION as a role model based on the following statement: I see myself as a role model of infant sleep practices… Level of self-recognition as a role model: (Visual Analog Scales) 0 = *Never self-identify as a role model* and 100 = *Always self-identify as a role model*
14a. Role model to parents
14b. Role model to colleagues
Belief: Using the below slider indicating your LEVEL OF BELIEF based on the statement: **I believe that a sleep-related death or SIDS event could happen during a work-shift.** Belief that a sleep-related death or SIDS event could happen at work (Visual Analog Scale) 0 = *Not at all* and 100 = *Absolutely*
15. I believe that a sleep-related death or SIDS event could happen during a work-shift

Inpatient pediatric nurses' practice items. The next variable measured inpatient pediatric nurses' self-reported infant sleep practices. This variable corresponded to items 9a – h, which

was answered using a 5-point Likert-type scale question with responses as *Never* = 1, *Sometimes* = 2, *About half the time* = 3, *Most of the time* = 4, and *Always* = 5, and 18. As 9b, 9c, and 9d were contrary to AAP recommendations, reverse coding was performed. A sum of the scores was then performed with a minimum score of 8 and a maximum score of 40 as achievable (Table 7, 10). The higher the sum of the scores, the more frequently inpatient pediatric nurses' infant sleep practices aligned with the 2016 AAP Safe Infant Sleep recommendations (Table 7, 10). Item 18 was completed by those inpatient pediatric nurses who were parents. This item sought to gain information, in the respondents' own words, through the use of open-field text, about the infant sleep practices they used with their own infant as a parent, and whether or not these practices aligned with AAP infant safe sleep recommendations. If the respondent was not a parent, they were asked to type "NA" in the text field, as it was not applicable.

In addition to inpatient pediatric nurses' infant sleep practices, this tool measured the infant sleep practices of inpatient pediatric nurses' colleagues, as seen through the eyes of the respondent (*normative beliefs*). This corresponded to item 10a-h (Appendix B) as a 5-point Likert-type scale question with responses as *Never* = 1, *Sometimes* = 2, *About half the time* = 3, *Most of the time* = 4, and *Always* = 5. An additional answer choice of "I don't know" was provided, for which, if selected, was excluded from the analysis. As 10b, 10c, and 10d were written in the negative, reverse coding was performed. A sum of the scores was performed with a minimum score of 8 and a maximum score of 40 as achievable (Table 7, 10). The higher the sum of the scores, the more frequently inpatient pediatric nurses' colleagues' infant sleep practices aligned with the 2016 AAP infant safe sleep recommendations.

Table 7 *Measure: Infant Sleep Practices*
Inpatient Pediatric Nurse: Based on YOUR OWN CURRENT PRACTICES in your role as a healthcare professional. When caring for infants under one year of age, how often… **5-point Likert-type scale (*reverse coded)**
Never = 1, S*ometimes* = 2, *About half the time* = 3, *Most of the time* = 4, and *Always* = 5
9a. Do I place infants to sleep on their back only
9b. Do I place a loose blanket (non-swaddled placement) on the infant*
9c. Do I place loose objects (blood pressure cuff, diapers, wipes, pulse oximeter probe, infant toys, etc.) in the crib*
9d. Do I use rolls, towels or another form of equipment to prop/position the infant in the crib for sleep*
9e. Do I support and/or encourage breastfeeding
9f. Do I, when finding an infant sharing a sleep surface with a parent, address the situation and educate on infant safe sleep and move the baby to a crib
9g. Do I, when finding an overdressed infant, educate on infant safe sleep environments to parents
9h. Do I remove loose and/or soft objects from the crib and educate parents about safe sleep
HCP Colleagues (*Normative beliefs*): Based on the current practices of YOUR COLLEAGUES as healthcare professionals. When caring for infants under one year of age, how often… **5-point Likert-type scale (*reverse coded)** *Never* = 1, *Sometimes* = 2, *About half the time* = 3, *Most of the time* = 4, and *Always* = 5
10a. Do my colleagues place infants to sleep on their back only
10b. Do my colleagues place loose objects (blood pressure cuff, diapers, wipes, pulse oximeter probe, infant toys, etc.) in the crib*
10c. Do my colleagues use rolls, towels or another form of equipment to prop/position the infant in the crib for sleep*
10d. Do my colleagues place a loose blanket (non-swaddled placement) on the infant*
10e. Do my colleagues support and/or encourage breastfeeding
10f. Do my colleagues, when finding an infant sharing a sleep surface with a parent, address the situation and educate on infant safe sleep and move the baby to a crib
10g. Do my colleagues re-dress overdressed infants and educate on infant safe sleep environments to parents
10h. Do my colleagues remove loose and/or soft objects from the crib and educate parents about safe sleep

Control and confidence items. Other variables the researcher examined were inpatient pediatric nurses' sense of control (item 12) and confidence (item 13) in practicing ISS practices (*perceived behavioral control*) using visual analog scales (Appendix B) ranging from 0 to 100

(Table 8, 10). The higher the number selected, the greater their control and confidence in practicing ISS.

Table 8 *Measure: Sense of Control and Confidence*
12. Using the below slider indicating your LEVEL OF CONTROL based on the statement: (Visual Analog Scale) 0 = *No control* and 100 = *Full control* I have complete control over performing infant sleep practices in my role as a healthcare professional.
13 Using the below slider indicating your LEVEL OF CONFIDENCE based on the statement: (Visual Analog Scale) 0 = *No control* and 100 = *Full control* I am confident that I can practice safe infant sleep in my role as a healthcare professional.

ISS initiative/policy. The presence or absence of an ISS initiative/policy (*control belief*) was assessed as the final variable in item 30 (Table 9). This initiative/policy on ISS serves as a standardized set of protocols that are based on current AAP safe infant sleep guidelines that must be followed for all infants admitted to the unit. This variable has no intrinsic ordering, as it is nominal and will therefore be merely coded as Yes = 1, No = 0, or I don't know = 0.

Table 9 *Measure: Presence of an ISS Initiative/Policy*
Yes/No Item Yes = 1, No/I don't know = 0
30. The unit I work on has an infant safe sleep policy.

A summary of all of the items combined from the source items was compiled with associated scoring and conceptual connections in Table 10. The additional demographic variables were part of the tool as items 18-29 and 31-32.

Table 10
Infant Sleep Practices (ISP) Tool Composition and Scoring

Item #	Variable/Construct	Question Type	Measurement	Scoring	Type
2-7	Knowledge/ Actual behavioral control	Multiple Select (item 2-4); Yes/No (item 5-7)	Sum score of correctly chosen answers; the higher the score, the greater the knowledge	Min = 0 Max = 6	Quantitative
8	Beliefs/ Behavioral beliefs	5-point Likert-scale; Scored 1-5	Sum score; the higher the score, the greater the belief in ISS practices	Min = 7 Max = 35	Quantitative
9	Practices/Actual behavior	5-point Likert-scale; Scored 1-5	Sum score; the higher the score, the greater the alignment with AAP ISS practices	Min = 8 Max = 40	Quantitative
10	Colleagues' practices/ Normative beliefs	5-point Likert-scale; Scored 1-5; "I don't know" as a 6th point (0 score)	Sum score; the higher the score, the greater the alignment with AAP ISS practices	Min = 8 Max = 40	Quantitative
11a, 11b	Attitudes	5-point Likert-scale; Scored 1-5	Sum score; the higher the score, the more positive the attitude toward ISS practices	Min = 2 Max = 10	Quantitative
11c-h	Beliefs/Subjective Norm	5-point Likert-scale; Scored 1-5	Sum score; the higher the score, the greater the influence on ISS practices in relation to AAP, colleagues and parents	Min = 2 Max = 10	Quantitative
12	Control/Perceived behavioral control	VAS; Scored 0-100	The higher the score, the greater the control over practicing ISS practices	Min = 0 Max = 100	Quantitative
13	Confidence/ Perceived behavioral control	VAS; Scored 0-100	The higher the score, the greater the confidence toward practicing ISS practices	Min = 0 Max = 100	Quantitative
14a, 14b	Beliefs/ Behavioral beliefs	VAS; Scored 0-100	Sum of the scores, the higher the score, the greater the self-recognition as role model of ISS	Min = 0 Max = 200	Quantitative
15	Beliefs/ Behavioral beliefs	VAS; Scored 0-100	The higher the score, the greater the belief a sleep-related/SIDS event could occur during work-shift	Min = 0 Max = 100	Quantitative
16, 17	Beliefs/Normative beliefs	Open-text field	Gain more depth of explanation with open-ended responses	Not applicable	Qualitative
18	Practices/Behavior	Open-text field	Gain more depth of explanation with open-ended responses	Not applicable	Qualitative
19-29, 31, 32	Demographics	Multiple Choice/ Select; Yes/No	Not applicable	Nominal	Quantitative
30	ISS initiative/ Policy/	Yes/No/I don't know	If not present = 0, If present = 1, I don't know = 0	Nominal	Quantitative

Data Analysis Plan

Descriptive statistical analyses were performed, as well as t-tests and one-way between groups ANOVA, using select demographic, and *ISP* tool scores and measures. In addition, Pearson's and Spearman's correlational analyses were performed to identify the existence of positive, negative, or any relationship among the variables of interest.

Ethical Considerations

Ethical issues and human rights are of the utmost concern in research. Approval for this study was obtained from the Institutional Review Board (IRB) at Molloy College. Throughout the study, adherence to ethical principles was considered for all those participating. All subjects participated on a voluntary basis, having the capability to withdraw at any time and for any reason. Anonymity was assured in the invitation to participate and maintained, along with all data collected. No foreseeable risks were anticipated. The data collected, which is password protected, will be held for three years, after which it will be destroyed.

Summary

This chapter illustrated the methods of this quantitative, descriptive study with a qualitative component examining inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices who provided care to infants during hospitalization in the acute care setting. In addition, the researcher examined whether relationships existed among inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of infant safe sleep, and the recommendations issued by the AAP, and personal characteristics such as age, academic degrees, level of education, and years in practice. This study examined the strength and direction of linear correlations that existed among the demographic and other variables of interest. Data analysis also included an analysis of the qualitative component from open-text field question on the

questionnaire for additional information about their knowledge, attitudes, beliefs, and practices and examined pre-disposing characteristics that influenced their beliefs about safe sleep.

CHAPTER FOUR: RESULTS AND FINDINGS

The purpose of this study was to examine inpatient pediatric nurses' ISS knowledge, attitudes, beliefs, and practices in providing care to infants during hospitalization in the acute care setting. This study also explored the relationships among personal and work characteristics, academic degrees, years in practice, and acceptance and belief of the scientific evidence used to establish infant sleep recommendations by the AAP.

This chapter presents the participants' personal characteristics, a descriptive summary of the general responses, and psychometric properties of the measures used to address the research questions. The findings in this chapter are organized according to the research questions and sub-questions. The sections of this chapter specify and itemize the findings of the data to address the research questions and sub-questions. Finally, it summarizes the general and specific findings to begin constructing a model for understanding the main research questions and sub-questions.

Sample

Study participants included a sample of inpatient pediatric nurses who were members of a nationwide pediatric nursing organization. To obtain a more representative sample of pediatric nurses in the United States, the entire membership of the Society of Pediatric Nurses (SPN) was contacted electronically. From this study population of members, a convenience sample was derived of those members who responded and met the inclusion criteria of pediatric nurses who were RNs and worked with infants in a pediatric, inpatient, hospital setting.

A total of 251 surveys were returned from those who consented to participate in the study. Preliminary analysis of the returned surveys resulted in the removal of 46 respondents who either did not meet the inclusion criteria or who did not complete an adequate portion of the survey. The inclusion criteria were for the inpatient pediatric nurse to be an RN who had been in

active practice in an inpatient pediatric setting, caring for infants (defined as newborn through 365 days old) for at least a year, or for at least one year prior to the COVID-19 pandemic, as their most frequently worked unit or population cared for may have changed. Of the 46 participants who were removed from the sample, 21 identified as Clinical Nurse Specialists (CNS), 9 identified as Nurse Practitioners (NP), 2 identified as other (Nurse Scientist and Staff Development Specialist), and 4 identified working in MB units (NICU/Nursery). Ten survey responses were removed because substantial amounts of data needed to run the analyses were missing. After ineligible surveys were removed, a sample of $n = 205$ was selected for analysis (Appendix E). G*Power software was used to conduct a priori power analysis, using an effect size of .3, a significance level of .05, and a power level of .8. The results showed that the current sample of 205 study participants provided sufficient statistical power for the various analyses performed.

Characteristics and Demographics

For all characteristic and demographic details discussed in this chapter, the data from the final sample of $n = 205$ were used. The demographic data obtained in the survey included age, gender, ethnicity, academic degree, number of years in practice, area of practice, type of unit most frequently worked, and parental status.

Personal characteristics. The personal characteristics identified in this section, shown in Table 11, are as follows. The results for gender indicated 93.2% ($n = 191$) were females, and 6.8% ($n = 14$) were males. These findings are consistent with pediatric specialty estimates. Although the National Council of State Boards of Nursing Workforce Study (NCSBN, 2020b) reported that 9.1% of US registered nurses are male, this number is estimated to be much lower in pediatrics (Institute of Pediatric Nursing [IPN], 2021; NCSBN, 2020b).

In order to encourage response rates for age reporting, the survey requested information regarding ranges in age, rather than an exact age number. Age groups were categorized with results as follows: less than 25 years of age *n* = 2 (1.0%), 25-30 years of age *n* = 39 (19.0%), 31-40 years of age *n* = 58 (28.3%), 41-50 years of age *n* = 53 (25.9%), 51- 60 years of age *n* = 33 (16.1%), 61-65 years of age *n* = 18 (8.8%), and older than 65 years of age *n* = 2 (1%). The distribution of age for this sample of nurses is consistent with the current nursing workforce averages (NCSBN, 2020b). The sample characteristics of race/ethnicity of the participants were as follows: Asian/Pacific Islander *n* = 9 (4.4%), Black/African American *n* = 14 (6.8%), Hispanic *n* = 12 (5.9%), White *n* = 166 (80.9%), and other *n* = 4 (2.0%). The race/ethnicity characteristics of this sample is fairly consistent with the US Bureau of Labor Statistics (2021) report of racial demographic distribution of the RN workforce that shows: Asian/non-Hispanic 8.7%, Black/non-Hispanic, 13.4%, Hispanic/Latino/Spanish, 7.9%, and White/non-Hispanic, 73.5%.

Parental status was also obtained from the sample. Of the *n* = 205 included in the sample, the results were as follows: *n* = 130 (63.4%) responded yes to being a parent, and *n* = 75 (36.6%) responded no to being a parent.

Table 11

Sample Demographics: Personal Characteristics

		N	Percent
Gender	Female	191	93.2%
	Male	14	6.8%
	Total	205	100%
Age	Less than 25	2	1.0%
	25-30	39	19.0%
	31-40	58	28.3%
	41-50	53	25.9%
	51-60	33	16.1%
	61-65	18	8.8%
	Greater than 65	2	1.0%
	Total	205	100%
Race/Ethnicity	Asian/Pacific Islander	9	4.4%
	Black/African American	14	6.8%
	Hispanic	12	5.9%
	White	166	80.9%
	Other	4	2.0%
	Total	205	100%
Parent	Yes	130	63.4%
	No	75	36.6%
	Total	205	100%

Academic degree and work experience. The academic degree and work experience of the participants in this study are displayed in Table 12. For degree type, bachelor's and master's degrees were the most frequently reported (48.8% and 35.1% respectively), with 9.8% holding an associate's degree and 6.3% a doctoral degree. This sample demonstrated higher educational preparation in comparison to the 2017 National Nursing Workforce Survey (NCSBN, 2020b), whereby the highest level of education for nurses is listed as follows: associate's degree (35.3%), bachelor's degree (45.8%), master's degree (15.8%), and doctoral degree (3.1%).

The work experience data were obtained as years in practice with these findings: less than 2 years in practice n = 10 (4.9%), 2-5 years in practice n = 38 (18.5%), 6-10 years of practice

Table 12

Sample Demographics: Academic Degree and Work Experience

		N	Percent
Degree Type	Associate's	20	9.8%
	Bachelor's	100	48.8%
	Master's	72	35.1%
	Doctoral	13	6.3%
	Total	205	100%
Years in practice	Less than 2 years	10	4.9%
	2-5	38	18.5%
	6-10	38	18.5%
	11-15	32	15.6%
	16-20	25	12.2%
	Greater than 20 years	62	30.3%
	Total	205	100%
Work Unit	Pediatrics	150	73.2%
	PICU	17	8.3%
	Other	38	18.5%
	Total	205	100%

n = 38 (18.5%), 11-15 years in practice *n* = 32 (15.6%), 16-20 years in practice *n* = 25 (12.2%), and greater than 20 years in practice *n* = 62 (30.3%).

The various units in which the sample worked were as follows: Pediatrics *n* = 150 (73.2%), PICU *n* = 17 (8.3%), and other *n* = 38 (18.5%), which were indicated as Float Team, Emergency Department, CICU, Surgical/Trauma, Pediatric Stepdown, etc. Participants employed in these areas met the inclusion criteria. All participants (*n* = 205, 100%) responded they had been in active practice in an inpatient pediatric, setting caring for infants (defined as newborn through 365 days old) for at least a year, or for at least a year, one year prior, as the COVID pandemic may have changed their most frequently worked unit or population cared for.

Knowledge

One of the variables examined was inpatient pediatric nurses' knowledge of the current AAP (2016) Safe Infant Sleep Recommendations. The results are displayed in Table 13. When asked to identify the AAP recommended safest sleep position for most infants, 100% of the participants correctly chose on their back. Eighteen participants (8.8%) also selected on their side, and *n* = 1 (0.5%) selected all three (on their back, on their side, and on their belly; prone. When asked which environments are recommended by the AAP for routine infant sleep, *n* = 55 (26.8%) selected one, and *n* = 66 (32.2%) selected two of the appropriate environments from the answers provided without including any unsafe environments in their selections. Also, 84 (41%) selected all three of the appropriate environments from the answers provided (bassinet or cradle, crib, and portable crib/play-yard), without including any unsafe environments in their selections. Not least, *n* = 185 (90.2%) participants selected no unsafe environments, *n* = 16 (7.8%) selected one unsafe environment, and *n* = 4 (2%) selected two unsafe environments. When asked to identify items that are acceptable to include in an infant's sleep environment without choosing any items deemed unsafe by the AAP, the results showed *n* = 1 (0.5%) selected none of the correct items, *n* = 39 (19%) identified one correct item, and *n* = 86 (42%) identified two correct items, and *n* = 79 (38.5%) identified all three correct items. An *n* = 173 (84.4%) selected none of the incorrect items, *n* = 23 (11.2%) participants selected one incorrect item, *n* = 6 (2.9%) selected two incorrect items, and *n* = 3 (1.5%) selected three incorrect items. The knowledge questions, presented in a true or false response, showed results as follows; most participants correctly agreed that the risk of SIDS can be reduced *n* = 198 (96.6%), and *n* = 7 (3.4%) responded incorrectly as false. An *n* = 180 (87.8%) responded false to infants being more likely to aspirate

Table 13

Knowledge Questions

	N	Percent
Based on the current infant sleep recommendations from the American Academy of Pediatrics (AAP), which of the following is considered the safest sleep position for most infants? (Mark all that apply)		
On their back (supine)*	205	100%
On their side	18	8.8%
On their belly (prone)	1	0.5%
I don't know	0	0%
Based on the current infant sleep recommendations from the AAP, which of the following environments are recommended for infant sleep? (Mark all that apply)		
Armchair or recliner	0	0%
Bassinet or cradle*	140	68.3%
Car seat	20	9.8%
Couch or sofa	0	0%
Crib*	204	99.5%
Infant swing	4	2%
Parent's bed	0	0%
Portable crib/play-yard*	95	46.3%
I don't know	0	0%
Based on the current recommendations of the AAP, which of the following items are acceptable to include in an infant's sleep environment? (Mark all that apply)		
Fitted crib sheet*	200	97.6%
Sleep positioning device (i.e., wedge, rolls)	24	11.7%
Bumpers	11	5.4%
Loose blanket or quilt	10	4.9%
Wearable blanket (i.e., blanket sleeper)*	144	70.2%
Pacifier*	100	48.8%
Pillow	2	1.0%
Stuffed animal or toy	1	0.5%
I don't know	0	0%
The risk of Sudden Unexpected Infant Death (SUID), such as Sudden Infant Death Syndrome (SIDS), can be reduced.		
True*	198	96.6%
False	7	3.4%
Total	205	100%
Infants are more likely to aspirate when placed on their back to sleep.		
True	25	12.2
False*	180	87.8%
Total	205	100%
It is safe for a parent and infant to share a sleep surface.		
True	10	4.9%
False*	195	95.1%
Total	205	100%
*Indicate correct answers		

when placed on their backs to sleep, and *n* = 25 (12.2%) incorrectly selected true. The final knowledge question showed *n* = 195 (95.1%) of participants correctly answered false to it is safe for a parent and infant to share a sleep surface, and *n* = 10 (4.9%) responded incorrectly with true. A knowledge score was calculated for each participant by summing the total number of correct responses. The mean knowledge score was 5.5 (range 0-6, *SD* = 1.18), with *n* = 153 (74.6%) of participants having gotten a perfect score of 6. Table 14 displays the results of all scores obtained.

Table 14

Knowledge Scores

Score	*N*	Percent
0	1	0.5%
1	3	1.5%
2	8	3.9%
3	6	2.9%
4	6	2.9%
5	28	13.7%
6	153	74.6%
Total	205	100%
Mean	5.5	
SD	1.2	

Inpatient Pediatric Nurses' Infant Sleep Practices

The researcher examined the infant sleep practices of inpatient pediatric nurses. Items 9a-h on the *ISP* tool were used to assess their practices. The results (Table 15) showed a mean score of 32.7 with an *SD* of 6.32. None of the participants scored less than 11, and only *n* = 18 (8.8%) achieved a perfect score of 40. Interpreting the data based on groups with the Likert-scale responses, the sum scores were grouped into categories. A sum score of 8 was categorized as *Never*, a sum score between 9-15 was categorized as *Rarely*, a sum score between 16-23 was categorized as *Sometimes*, a sum score between 24-31 was categorized as *About half the time*, a

sum score between 32-39 was categorized as *Most of the time*, and a sum score of 40 was categorized as *Always*. The results showed the following (Table 16): the findings of the grouped categories were *n* = 3 (1.5%) as *rarely*, *n* = 22 (10.7%) as *sometimes*, *n* = 41 (20%) as *about half the time*, *n* = 121 (59%) as *most of the time*, and *n* = 18 (8.8%) as *always*. None of these grouped categories were used in any of the analyses. This grouping of responses was for descriptive purposes only.

Table 15

Inpatient Pediatric Nurses' Infant Sleep Practices Scores

Likert-style Scoring	Score Ranges	*N*	Percent
Never	8	0	0%
Rarely	9-15	3	1.5%
Sometimes	16-23	22	10.7%
About half the time	24-31	41	20.0%
Most of the time	32-39	121	59.0%
Always	40	18	8.8%
Total	205	205	100%
Mean	32.65		
SD	6.32		

Infant Sleep Practices of Inpatient Pediatric Nurses' Colleagues

The researcher measured the infant sleep practices of inpatient pediatric nurses' colleagues as seen through the eyes of the respondent (*normative beliefs*). Items 10a-h on the *ISP* tool were used to assess the practices of inpatient pediatric nurses' colleagues. These items were answered using a 5-point Likert-type scale. A sum of the scores was performed with a minimum score of 8 and a maximum score of 40 as achievable. Those respondents who answered I don't know (*n* = 59) were excluded from the analysis and those sum scores were not calculated. G*Power software was used to conduct a priori power analysis on the responses returned for inpatient pediatric nurses' colleagues' practices, as it was less than the sample *n* = 205. The results showed that *n* = 146 still provided sufficient statistical power for the various analyses

performed. With an n = 146 (71.2%) included in the analysis, the results showed a mean score of 28.77 with a *SD* of 5.98. None of the participants scored less than 12, and only 4 (2.0%) achieved a perfect score of 40. Interpreting the data based on groups with the Likert-type scale responses, the sum scores were grouped into categories. A sum score of 8 was categorized as *Never*, a sum score between 9-15 was categorized as *Rarely*, a sum score between 16-23 was categorized as *Sometimes*, a sum score between 24-31 was categorized as *About half the time*, a sum score between 32-39 was categorized as *Most of the time*, and a sum score of 40 was categorized as *Always*. The results are shown in Table 16. None of these grouped categories were used in any of the analyses. This grouping of responses was for descriptive purposes only.

Table 16

Infant Sleep Practices of Inpatient Pediatric Nurses' Colleagues Scores

Likert-style Scoring	Ranges	*N*	Percent
Never	8	0	0%
Rarely	9-15	2	1.0%
Sometimes	16-23	28	13.6%
About half the time	24-31	63	30.7%
Most of the time	32-39	49	23.9%
Always	40	4	2.0%
I don't know	N/A	59	28.8%
Total	205	205	100%
Mean	28.77		
SD	5.98		

A paired sample t-test was conducted to compare inpatient pediatric nurses' infant sleep practice scores to those scores derived from what the participants reported for the practice of their inpatient pediatric nurse colleagues. For this test, n = 146 was used to provide equal pairing for those who provided responses on their colleagues' practices and did not select I don't know. There was a statistically significant difference found between inpatient pediatric nurses' practices (M = 33.0, SD = 6.27) and those of the inpatient pediatrics' colleagues (M = 28.77, *SD*

= 5.98), ($t(145) = 12.46$, $p = .000$). The mean difference = 4.23 with a 95% CI [3.56, 4.91], and a Cohen's $d = .69$, signifying a moderate effect size. Displayed in Table 17 is a side-by-side comparison of the individual item responses of infant sleep practices of inpatient pediatric nurse participants and the responses they reported for their colleagues. Figure 9 is a bar chart providing a side-by-side comparison of the mean scores for each individual item reported by inpatient pediatric nurses' regarding their infant sleep practices and those of their colleagues.

Table 17

Inpatient Pediatric Nurses' Infant Sleep Practices Compared to Infant Sleep Practices of Inpatient Pediatric Nurses' Colleagues

	Inpatient Pediatric Nurses		*Inpatient Pediatric Nurses' Colleagues*	
Likert-style Scoring	*N*	Percent	*N*	Percent
Please answer the following items based on your CURRENT PRACTICES in your role as a healthcare professional. When caring for infants under one year of age, how often do I/my colleagues….				
	Inpatient Pediatric Nurses'		*Inpatient Pediatric Nurses' Colleagues*	
Place infants to sleep on their back only				
Never	3	1.5%	5	2.4%
Sometimes	6	2.9%	9	4.4%
About half the time	17	8.3%	20	9.8%
Most of the time	44	21.5%	77	37.6%
Always	135	65.9%	74	36.1%
I don't know	N/A	N/A	20	9.8%
Total	205	100%	205	100%
Mean	4.5		4.1	
SD	.88		.97	
Place a loose blanket (non-swaddled placement)				
Never	95	46.3%	32	15.6%
Sometimes	57	27.8%	79	38.5%
About half the time	15	7.3%	33	16.1%
Most of the time	29	14.1%	38	18.5%
Always	9	4.4%	7	3.4%
I don't know	N/A	N/A	16	7.8%
Total	205	100%	205	100%
Mean	2.0		2.5	
SD	1.2		1.1	
Place loose objects (diapers, wipes, pulse oximeter) in crib				
Never	76	37.1%	19	9.3%
Sometimes	79	38.5%	71	34.6%
About half the time	12	5.9%	34	16.6%
Most of the time	24	11.7%	43	21.0%
Always	14	6.8%	24	11.7%
I don't know	N/A	N/A	14	6.8%
Total	205	100%	205	100%
Mean	2.1		2.9	
SD	1.2		1.2	
Use rolls, towels, or another form to prop/position infant				

Never		59	28.8%	26	12.7%
Sometimes		83	40.5%	71	34.6%
About half the time		21	10.2%	30	14.6%
Most of the time		27	13.2%	47	22.9%
Always		15	7.3%	16	7.8%
I don't know		N/A	N/A	15	7.3%
	Total	205	100%	205	100%
	Mean	2.3		2.8	
	SD	1.2		1.2	
Support and/or encourage breastfeeding					
Never		3	1.5%	3	1.5%
Sometimes		11	5.4%	15	7.3%
About half the time		19	9.3%	23	11.2%
Most of the time		48	23.4%	63	30.7%
Always		124	60.5%	61	29.8%
I don't know		N/A	N/A	40	19.5%
	Total	205	100%	205	100%
	Mean	4.4		4.0	
	SD	.96		1.0	
When finding an infant sharing a sleep surface with a parent, address the situation and educate on infant safe sleep and move the baby to a crib					
Never		2	1.0%	3	1.5%
Sometimes		10	4.9%	28	13.7%
About half the time		17	8.3%	31	15.1%
Most of the time		60	29.3%	56	27.3%
Always		116	56.6%	51	24.9%
I don't know		N/A	N/A	36	17.6%
	Total	205	100%	205	100%
	Mean	4.4		3.7	
	SD	.90		1.1	
Remove loose and/or soft objects from the crib and educate parents about safe sleep					
Never		5	2.4%	4	2.0%
Sometimes		21	10.2%	49	23.9%
About half the time		24	11.7%	32	15.6%
Most of the time		67	32.7%	51	24.9%
Always		88	42.9%	32	15.6%
I don't know		N/A	N/A	37	18.0%
	Total	205	100%	205	100%
	Mean	4.0		3.4	
	SD	1.1		1.2	
Re-dress overdressed infants and educate on infant safe sleep to parents					
Never		9	4.4%	4	2.0%
Sometimes		29	14.1%	42	20.5%
About half the time		24	11.7%	33	16.1%
Most of the time		59	28.8%	57	27.8%
Always		84	41.0%	25	12.2%
I don't know		N/A	N/A	44	21.5%
	Total	205	100%	205	100%
	Mean	3.9		3.4	
	SD	1.2		1.1	

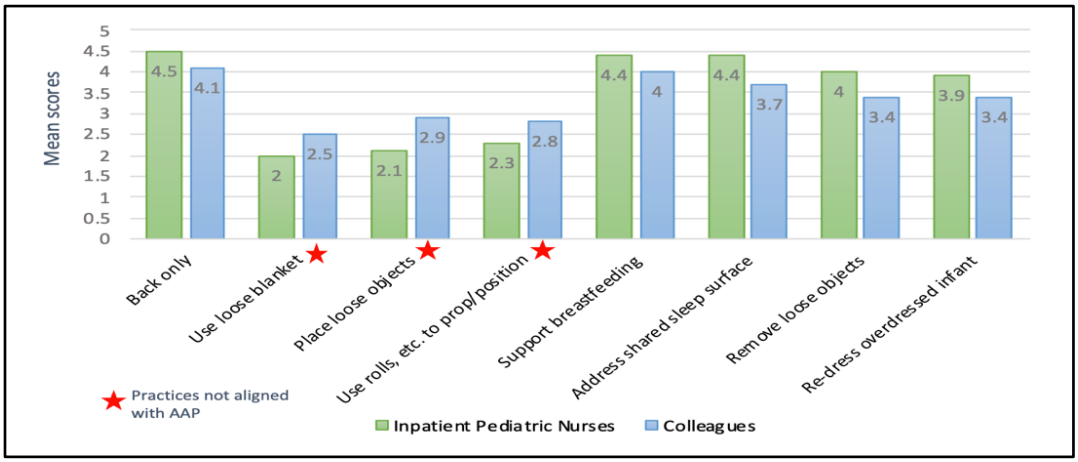

Figure 9. Inpatient Pediatric Nurses' Infant Sleep Practices and Infant Sleep Practices of Pediatric Nurses' Colleagues. This figure shows a side-by-side comparison of the differences of the means per item of inpatient pediatric nurses' practices and those of their colleagues.

Attitudes

The next variable examined was inpatient pediatric nurses' attitudes toward practices of ISS. This variable corresponded to items 11a and 11b on the *ISP* tool. Participants responded using a 5-point Likert-type scale. A sum of the scores was performed to measure inpatient pediatric nurses' attitudes towards ISS practices. All of the 205 participants were included in this analysis. The results showed the following: the mean was 9.2 (range 2 - 10, *SD* 1.2) with respondents scores ranging from 5-10 with *n* = 117 (57.1%) having a score of 10, *n* = 42 (20.5%) having a score of 9, *n* = 24 (11.7%) having a score of 8, *n* = 14 (6.8%) having a score of 7, *n* = 6 (2.9%) having a score of 6, and *n* = 2 (1%) having a score of 5.

Beliefs

Other variables analyzed were inpatient pediatric nurses' beliefs toward ISS practices based on AAP Safe Infant Sleep recommendations, and important referents' influence on their infant sleep practices. The findings of belief in AAP recommendations sum of the scores showed a range from 15-35 (*M* = 30, *SD* = 3.8) with *n* = 5 (2.4%) scoring between 12-20, *n* = 40,

(19.5%) scoring between 21-27, *n* = 136 (66.3%) scoring between 28-34, and *n* = 24 (11.7%) scoring 35. The results of 8a-g are itemized in Table 18.

Table 18

Beliefs

Please answer the following based on your BELIEFS about infant sleep practices in your role as a healthcare professional. In your opinion, how important do you REALLY feel these factors are for infant safe sleep?		
	N	Percent
Infant's sleep position as supine (back) position		
Not at all important	0	0%
Minimally important	4	2.0%
Somewhat important	13	6.3%
Moderately important	34	16.6%
Very important	154	75.1%
Total	205	100%
Mean	4.7	
SD	.69	
Infant's sleep environment (i.e. firm surface, no pillows/blankets, no toys)		
Not at all important	0	2.0%
Minimally important	4	7.8%
Somewhat important	16	11.2%
Moderately important	23	11.2%
Very important	162	79%
Total	205	100%
Mean	4.7	
SD	.70	
Breastfeeding		
Not at all important	6	2.9%
Minimally important	11	5.4%
Somewhat important	44	21.5%
Moderately important	49	23,9%
Very important	95	46.3%
Total	205	100
Mean	4.0	
SD	1.1	
Infant sharing a sleep surface (i.e., bed-sharing, chair-sharing)		
Not at all important	18	8.8%
Minimally important	5	2.4%
Somewhat important	16	7.8%
Moderately important	24	11.7%
Very important	142	69.3%
Total	205	100%
Mean	4.3	
SD	1.3	
Amount/layers of clothes infant is wearing while sleeping		
Not at all important	3	1.5%

Minimally important		9	4.4%
Somewhat important		26	12.7%
Moderately important		70	34.1%
Very important		97	47.3%
	Total	205	100%
	Mean	4.2	
	SD	.93	
Offering the infant a pacifier at bedtime			
Not at all important		14	6.8%
Minimally important		28	13.7%
Somewhat important		71	34.6%
Moderately important		53	25.9%
Very important		39	19.0
	Total	205	100%
	Mean	3.4	
	SD	1.1	
Nurse's role modeling safe infant sleep practices in the hospital			
Not at all important		0	0%
Minimally important		3	1.5%
Somewhat important		7	3.4%
Moderately important		29	14.1%
Very important		166	81%
	Total	205	100%
	Mean	4.8	
	SD	.59	

Items 11c-h measured the amount of influence the AAP, colleagues, and parents of the infants (dependent on parent satisfaction rating) have on inpatient pediatric nurses' infant sleep practices (*subjective norm*). These items were grouped according to the influencer (important referents) and therefore were grouped as AAP, colleagues, and parents, with the scores performed on items 11c and f, 11d and g, and 11e and h. As items 11f, 11g, and 11h were written in the negative, reverse coding was performed. A sum score was then obtained for each of the pairs of items. For each of these groupings, a minimum sum score of 2 and a maximum score of 10 could be obtained. The higher the sum of the scores indicated a greater influence on the inpatient pediatric nurses' infant sleep practices. The findings of the sum of the scores, based on item grouping are as follows; based on an $n = 205$, 11c and f had ($M = 8.2$, $SD = 1.5$), with $n = 0$ (0%) scoring 2, $n = 1$ (0.5%) scoring 3, $n = 1$ (0.5%) scoring 4, $n = 5$ (2.4%) scoring 5, $n = 28$

(13.7%) scoring 6, *n* = 31 (15.1%) scoring 7, *n* = 36 (17.6%) scoring 8, *n* = 47 (22.9%) scoring 9, and *n* = 56 (27.3%) scoring 10 (Figure 10). Based on *n* = 205, 11d and g had a mean = 6.5, *SD* 1.9 with *n* = 6 (2.9%) scoring 2, *n* = 11 (5.4%) scoring 3; *n* = 14 (6.8%) scoring 4, *n* = 27 (13.2%) scoring 5, *n* = 39 (19%) scoring 6, *n* = 46 (22.4%) scoring 7, *n* = 31 (15.1%) scoring 8, *n* = 21 (10.2%) scoring 9, and *n* = 10 (4.9%) scoring 10 (Figure 11). Based on *n* = 204, with *n* = 1 missing, 11e and h had a mean = 5.6, *SD* 1.6 with *n* = 8 (3.9%) scoring 2, *n* = 12 (5.9%) scoring 3, *n* = 22 (10.7%) scoring 4, *n* = 44 (21.5%) scoring 5, *n* = 63 (30.7%) scoring 6, *n* = 33 (16.1%) scoring 7, *n* = 18 (8.8%) scoring 8, *n* = 1 (0.5%) scoring 9, and *n* = 3 (1.5%) scoring 10 (Figure 12).

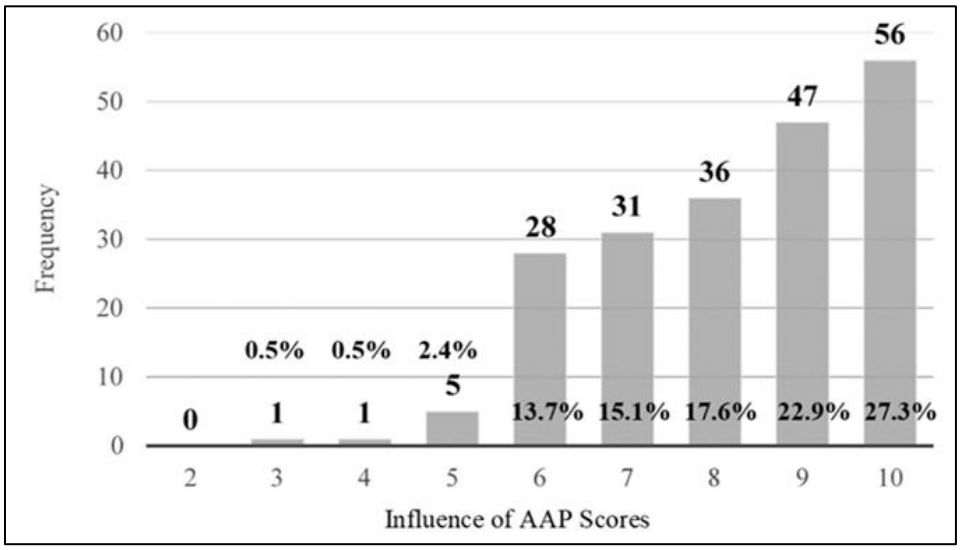

Figure 10. Frequency Chart of Influence of AAP Scores. This figure shows the frequency of scores for the influence of the AAP on inpatient pediatric nurses.

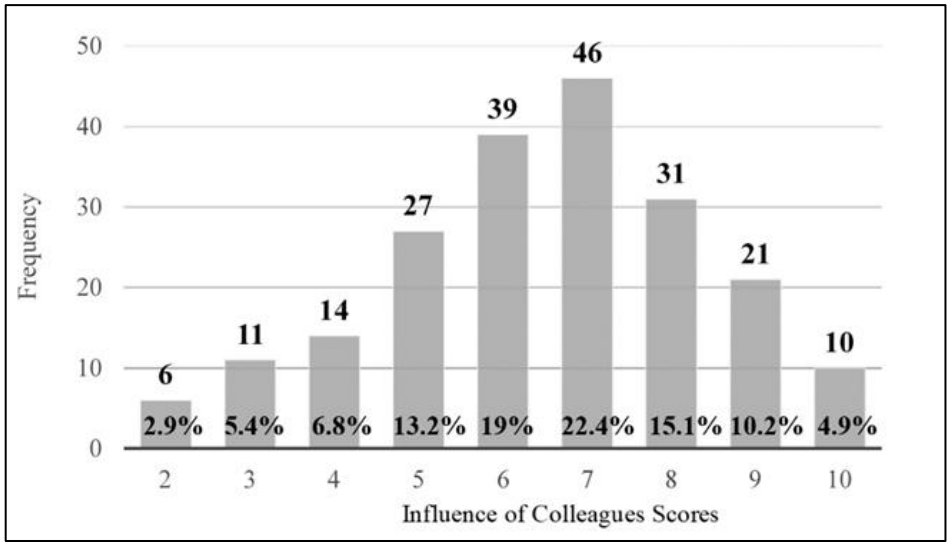

Figure 11. Frequency Chart of Influence of Colleague Scores. This figure shows the frequency of scores for the influence of colleagues on inpatient pediatric nurses

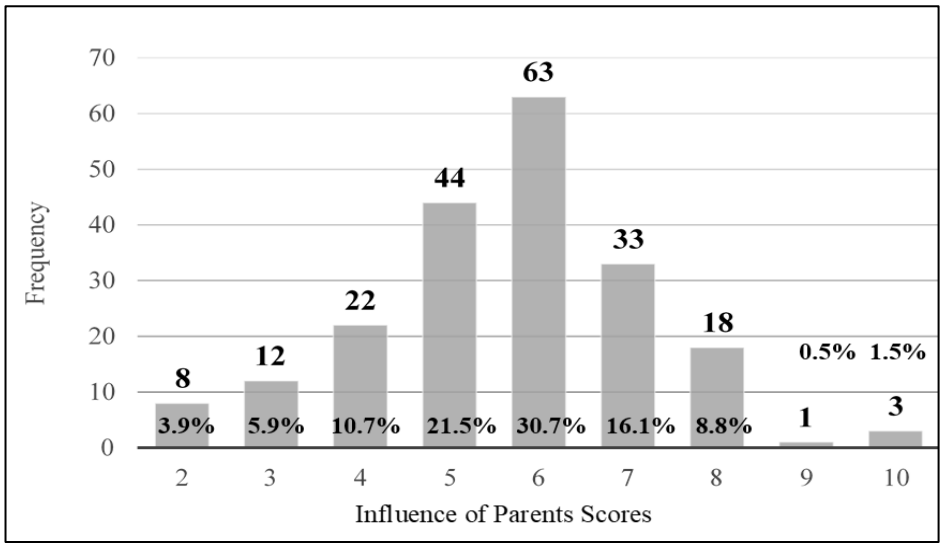

Figure 12. Frequency Chart of Influence of Parents Scores. This figure shows the frequency of scores for the influence of parents on inpatient pediatric nurses.

Item 14 measured the belief of inpatient pediatric nurses' self-recognition as a role model of infant sleep practices to parents (14a), and to colleagues (14b) using VAS ranging from 0 to 100. These scores were combined to obtain a score from 0 to 200 to determine the respondents'

total level of self-recognition as a role model. The higher the number selected, the greater the belief of inpatient pediatric nurses' self-recognition as a role model. The results (Table 19) showed a mean = 172.4, *SD* = 29.6 with a range from 75-200 with *n* = 0 (0%) scoring < 75, and *n* = 56 (27.3%) participants achieving a score of 200. In total, *n* = 7 (3.4%) participants scored between 75-99, *n* = 32 (15.6%) scored between 100-149, and *n* = 110 (53.7%) scored between 150-199.

Item 15, a VAS with a range from 0 to 100, measured the inpatient pediatric nurses' belief that a sleep-related death or SIDS event could occur during a work-shift on their unit. The higher the number selected, the greater the belief an event as such could occur during a work-shift. The results (Figure 13, Table 19) showed *n* = 5 (2.4%) selected 0, and *n* = 81 (39.5%) selected 100. The results showed a range from 0-100 with a mean of 68.1, *SD* = 36.4, with *n* = 41 (20%) scoring between 1-24, *n* = 10 (4.9%) scoring between 25-49, *n* = 33 (16.1%) scoring between 50-74, and *n* = 35 (17.1%) scoring between 75-99.

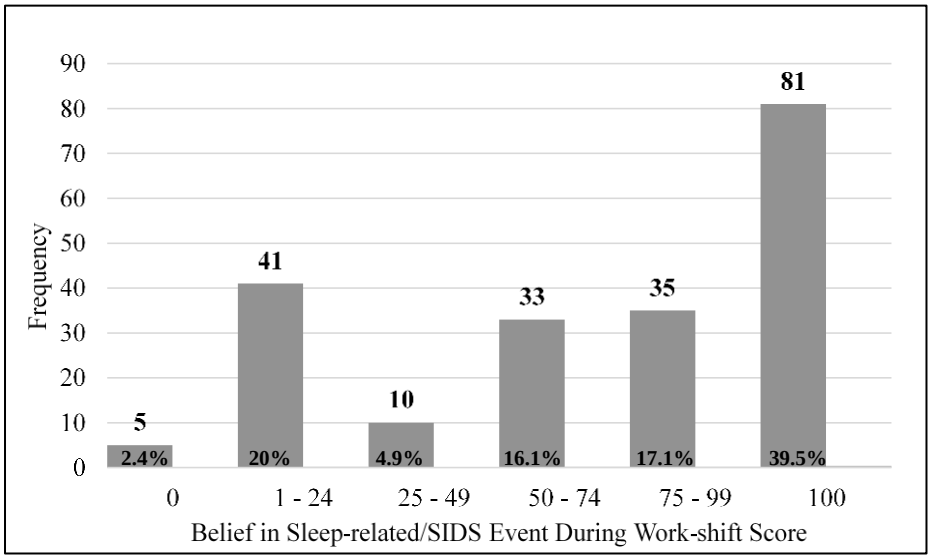

Figure 13. Frequency Chart of Belief in Sleep-related/SIDS Event During Work-shift Scores. This figure shows the frequency of range scores for inpatient pediatric nurses' level of belief that a sleep-related/SIDS event could occur during a work-shift.

Table 19

Descriptive Statistics of Visual Analog Scales

	Control	Confidence	Role Model Sum	SUID Event
Mean	80.8	90.6	172.4	68.1
SD	16.8	13.2	29.6	36.4
N	205	205	205	205

Control and Confidence

Other variables examined were inpatient pediatric nurses' sense of control (item 12) and confidence (item 13) in practicing ISS in their role as an HCP (*perceived behavioral control*). Using visual analog scales, ranging from 0 to 100, respondents selected their desired value for each. The higher the number was selected, the greater their perceived control and/or confidence was in practicing ISS in their role as an HCP. The results for the control item (Table 19) showed $M = 80.8$, $SD = 16.8$, with $n = 0$ (0%) scoring 0, $n = 2$ (1%) scoring between 1-24, $n = 8$ (3.9%) scoring between 25-49, $n = 46$ (22.4%) scoring between 50-74, $n = 114$ (55.6%) scoring between 75-99, and $n = 35$ (17.1%) scoring 100. The results for the confidence item (Table 19) showed a $M = 90.6$, $SD = 13.2$, with $n = 0$ (0%) scoring 0, $n = 1$ (0.5%) scoring between 1-24, $n = 4$ (2.0%) scoring between 25-49, $n = 12$ (5.9%) scoring between 50-74, $n = 108$ (52.7%) scoring between 75-99, and $n = 80$ (39%) scoring 100.

Infant Safe Sleep Initiative/Policy

The presence or absence of an ISS initiative/policy (*control belief*) was assessed as another variable. This variable had no intrinsic ordering, as it was nominal, and was therefore merely coded as Yes = 1, No = 0 or I don't know = 0. The results showed $n = 158$ (77.1%) respondents answered yes, $n = 20$ (9.8%) answered no, and $n = 27$ (13.2%) answered I don't know.

Relationships Among Variables

This researcher explored whether relationships existed among the variables of interest in this study. Several analyses were conducted using Pearson's correlation, Spearman's correlation, t-test, and ANOVA. The results were as follows.

Correlations of personal characteristics. Personal characteristics were variables of interest for this study. The variables of gender and race were not included in the analyses because the distribution of participants in the groups was not similar. Therefore, to avoid making a Type I error, these variables were not used in any of the analyses.

Age. To make the age ranges of the sample more homogeneous in nature, the group of less than 25 years of age was collapsed into the group ranging from 25-30. In addition, the groups of 51-60, 61-65, and greater than 65 years of age were collapsed into greater than 50 years of age. The total number of participants per group was: less than 25 years of age to 30 n = 41 (20%), 31-40 years of age n = 58 (28.3%), 41-50 years of age n = 53 (25.9%), and greater than 50 years of age n = 53 (25.9%). A Spearman's Correlation was performed using the entire sample of 205 to determine significance at the $p \leq .05$ level. Table 20 displays the variables that demonstrated statistically significant correlations with age. Table 21 shows all one-way between groups ANOVA for age.

Age and belief in American Academy of Pediatrics recommendations. The statistically significant correlations between inpatient pediatric nurses' personal characteristics and their attitudes and beliefs about ISS scores were found with age and belief (*behavioral beliefs*) in the AAP recommendations with a weak positive correlation ($rs(203) = .208$, $p = .003$). A one-way between groups ANOVA was conducted to compare inpatient pediatric nurses' belief in the AAP recommendations score for age groups of < 25-30 years old, 31-40 years old, 41-50 years old,

and > 50 years. There was a statistically significant difference in scores between groups based on age found at the $p \leq .05$ level, F (3, 201) = 3.9, p = .01. The effect size, calculated using eta squared, was .06. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant difference between age groups > 50 years old and < 25-30 years old with a mean difference of 2.61, p = .005.

Age and self-recognition as a role model. Another weak positive correlation was found with age and the inpatient pediatric nurses' self-recognition as a role model of infant sleep practices (*behavioral beliefs*) at the p = .05 level, (*rs*(203) = .136, p = .052). A one-way between groups ANOVA was conducted to compare inpatient pediatric nurses' self- recognition as a role model of infant sleep practices for these age groups. There was a statistically significant difference in scores between groups based on age found at the $p \leq .05$ level, F (3, 201) = 6.27, p = .000. The effect size, calculated using eta squared, was .09. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant difference between age groups 31-40 years old and that of < 25-30 years old with a mean difference of 21.02, p = .002, and another statistically significant difference between groups > 50 years old and < 25-30 years old with a mean difference of 29.4, p = .002.

Age and influence of American Academy of Pediatrics on infant sleep practices. Another weak positive correlation was found with age and the influence of the AAP on the inpatient pediatric nurses' practices (*subjective norm*) (*rs*(203) = .139, p = .046). A one-way between groups ANOVA was conducted to compare the influence of the AAP on the inpatient pediatric nurses' practices scores for these age groups. There was no statistically significant difference found at the $p \leq .05$ level for the four conditions of age.

Table 20

Statistically Significant Spearman's Correlations for Age (n = 205)

Variable	*rs*	Sig (2-tailed)
Belief in AAP recommendations	.208**	.003
Self-recognition as role model	.136*	.052
Influence of AAP	.139*	.046

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.

Additional findings for age. A one-way between groups ANOVA was conducted between the age groups and all other variables of interest. Although not noted on Spearman's correlation, three other statistically significant findings were noted on the one-way between groups ANOVA that were conducted on age and all variables of interest to compare the effect of age. For age and inpatient pediatric nurses' knowledge of infant safe sleep scores, there was a statistically significant difference noted at the $p \leq .05$ level, F (3, 201) = 2.972, p = .035. The effect size, calculated using eta squared, was .042. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant difference between the 31-40 years old, 41-50 years old groups, with a mean difference of .61256, p = .031.

The one-way between groups ANOVA conducted on age and inpatient pediatric nurses' practices of infant safe sleep scores identified a statistically significant difference in the practices of infant safe sleep scores between groups based on age found at the $p \leq .05$ level, F (3, 201) = 2.983, p = .032. The effect size, calculated using eta squared, was .04. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant difference between the groups > 50 years old and 41-50 years old with a mean difference of 3.245, p = .040.

Table 21

ANOVA Table for Age

		Sum of squares	*df*	Mean Squares	*F*	Sig
Belief in AAP recommendations	Between Groups	164.679	3	54.893	3.901	.010**
	Within groups	2828.316	201	14.071		
	Groups Total	2992.995	204			
Self-recognition as role model	Between Groups	15287.533	3	5095.844	6.270	.000**
	Within groups	163366.692	201	812.770		
	Groups Total	178654.224	204			
Influence of AAP	Between Groups	16.831	3	5.610	2.390	.070 NS
	Within groups	471.929	201	2.348		
	Groups Total	488.761	204			
Confidence	Between Groups	2116.671	3	705.557	4.227	.006**
	Within groups	33553.085	201	166.931		
	Groups Total	35669.756	204			
Inpatient pediatric nurses' infant sleep practices	Between Groups	347.781	3	115.927	2.983	.032*
	Within groups	7810.629	201	38.859		
	Groups Total	8158.410	204			
Knowledge	Between Groups	11.917	3	3.972	2.925	.035*
	Within groups	272.981	201	1.358		
	Groups Total	284.898	204			

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.

Additionally, a statistically significant finding was noted on the one-way between groups ANOVA conducted on age and confidence scores. There was a statistically significant difference noted in the confidence scores between groups based on age found at the $p \leq .05$ level, F (3, 201) = 4.23, p = .006. The effect size, calculated using eta squared, was .06. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant difference between age groups 31-40 years old and < 25-30 years old with a mean difference of 8.30, p = .010, and between age groups > 50 years old and < 25-30 years old with a mean difference of 8.46, p = .010.

Overall findings of age. The overall findings of age indicate that the greater the age of the inpatient pediatric nurses, the higher the belief in the AAP recommendations, the higher the self-recognition as a role model, the higher the influence of the AAP on the inpatient pediatric nurses' practices, and the higher the confidence. Although these findings are noted with increased age, a finding noted with younger age (31-40 vs. 41-50) showed a higher level of knowledge of the AAP recommendations.

Parental status. Another variable of interest of inpatient pediatric nurses' personal characteristics was their parental status. There were statistically significant correlations identified between parental status and the other variables of interest. Independent-samples t-test were conducted to compare all variables of interest for both groups with no other statistically significant findings other than as noted in the following sections. Table 22 shows all statistically significant correlations identified with parental status. Table 23 shows the statistically significant findings noted on the Independent-samples t-tests conducted for parental status. The results are as follows.

Table 22

Statistically Significant Spearman's Correlations for Parental Status (n = 205)

Variable	*rs*	Sig (2-tailed)
Self-recognition as role model	.182**	.009
Inpatient pediatric nurses' practices	.174**	.012
Confidence	.132	.059
Inpatient pediatric nurses' colleagues' practices	.166*	.046

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.

Parental status and self-recognition as a role model. There was a statistically significant weak positive correlation between parental status and the inpatient pediatric nurses' self-recognition as a role model of infant sleep practices ($rs(203) = .182$, $p = .009$). Independent-samples t-test was conducted to compare the inpatient pediatric nurses' self-recognition as a role model of infant sleep practice scores for both groups. The results showed a statistically significant difference in scores for inpatient pediatric nurses who reported yes to being a parent ($M = 176.88$, $SD = 25.29$) and no to being a parent ($M = 164.72$, $SD = 34.70$), with $t(119.85) = 2.65$, $p = .009$. The magnitude of the differences in the means (mean difference = 12.16, 95% CI: 3.09 to 21.23) was moderate (Cohen's $d = .40$).

Parental status and inpatient pediatric nurses' infant sleep practices. There was a statistically significant weak positive correlation found between parental status and inpatient pediatric nurses' infant sleep practices ($rs(203) = .174$, $p = .012$). An independent-samples t-test was conducted to compare the inpatient pediatric nurses' infant sleep practice scores for both groups. The results showed a statistically significant difference in scores for inpatient pediatric nurses' who reported yes to being a parent ($M = 33.35$, $SD = 6.24$) and no to being a parent ($M =$

31.44, *SD* = 6.33) with *t* (203) = 2.105, *p* = .037. The magnitude of the differences in the means (mean difference = 1.91, 95% CI: .11 to 3.72) was small (Cohen's *d* = .305).

Parental status and confidence. There was a statistically significant weak positive correlation identified between parental status and confidence scores found at the *p* = .05 level (*rs*(203) = .132, *p* = .059). An independent-samples t-test was conducted to compare the inpatient pediatric nurses' infant sleep practice scores for both groups. There was no statistically significant difference found at the $p \leq .05$ level for parental status.

Parental status and inpatient pediatric nurses' colleagues' infant sleep practice. There was one last statistically significant weak positive correlation found between parental status and inpatient pediatric nurses' colleagues' infant sleep practices (*rs*(144) = .166, *p* = .046). An independent-samples t-test was conducted to compare the inpatient pediatric nurses' colleagues' sleep practice scores for both groups. The results showed a statistically significant difference in scores for inpatient pediatric nurses' who reported yes to being a parent (*M* = 29.55, *SD* = 5.97) and no to being a parent (*M* = 27.42, *SD* = 5.80) with *t* (144) = 2.098, *p* = .038. The magnitude of the differences in the means (mean difference = 2.13, 95% CI: .12 to 4.14) was small (Cohen's *d* = .362).

Overall findings with parental status. The overall findings of parental status indicate that those inpatient pediatric nurses who responded yes to being a parent have greater self-recognition as a role model, greater confidence, and their infant sleep practices align more with the AAP recommendations of infant safe sleep. In addition, there is a relationship with those inpatient pediatric nurses who responded yes to being a parent with greater scores of the infant sleep practices of their colleagues.

Table 23

Independent-sample t-tests for Parental Status

Variable	Parental Status YES		Parental Status NO		*t*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Self-recognition as a role model	176.88	25.29	164.72	34.70	2.65	.009**	.401
N	130		75				
Inpatient pediatric nurses' infant sleep practices	33.3538	6.23800	31.4400	6.32934	2.105	.037*	.305
N	130		75				
Inpatient pediatric nurses' colleagues' infant sleep practices	29.5484	5.96824	27.4154	5.80263	2.098	.038*	.362
N	93		53				

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.

Academic degrees. The researcher examined whether any relationships existed between academic degrees attained and the inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of current American Academy of Pediatrics (2016) infant safe sleep recommendations. Table 24 shows all one-way between groups ANOVA for academic degrees. The results were as follows.

Academic degrees and belief in a work-shift sleep-related/SIDS event. A statistically significant weak positive correlation noted was between degree and belief that a sleep-related/SIDS event could occur during a work-shift ($rs(203) = .179$, $p = .010$). A one-way between groups ANOVA was conducted to compare degree with the scores on this variable with a statistically significant difference noted between groups. There was a difference found at the $p = .05$ level, $F(3, 201) = 2.54$, $p = .058$. With a result at that level, further analysis was performed. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant

difference between the associate's degree and doctoral degree with a mean difference of -33.39, $p = .048$.

Additional findings with academic degrees. Although not noted on Spearman's correlation, two statistically significant differences were identified on the one-way between groups ANOVA that was conducted with degree and all variables of interest. For degree and inpatient pediatric nurses' belief in the AAP recommendations, there was a difference found at the $p \leq .05$ level, F (3, 201) = 2.940, $p = .034$. The effect size, calculated using eta squared, was .045. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant difference between the associate's degree and bachelor's degree with a mean difference of -2.470, $p = .041$, and associate's degree and doctoral degree with a mean difference of -3.408, $p = .058$.

A one-way between groups ANOVA was conducted to compare the knowledge scores by degree and revealed a statistically significant result found at the $p \leq .05$ level, F (3, 201) = 3.17, $p = .025$. Post-Hoc comparisons using the Tukey HSD test indicated a statistically significant difference between the associate's degree and bachelor's degree with a mean difference of -.8200, $p = .023$, and the associate's degree and master's degree with a mean difference of -.856, $p = .021$.

Table 24

ANOVA Table for Academic Degrees

		Sum of squares	*df*	Mean Squares	*F*	Sig
Knowledge	Between Groups	12.883	3	4.294	3.173	.025*
	Within groups	272.015	201	1.353		
	Groups Total	248.898	204			
Belief in a work-shift sleep-related/SIDS event	Between Groups	9865.171	3	3288.390	2.537	.058
	Within groups	260567.004	201	1296.353		
	Groups Total	270432.176	204			
Belief in AAP recommendations	Between Groups	125.796	3	41.932	2.940	.034*
	Within groups	2867.199	201	14.265		
	Groups Total	2992.995	204			

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.

Overall findings with academic degrees. The overall findings of academic degrees indicated that those inpatient pediatric nurses who have advanced degrees have a greater knowledge of the AAP infant safe sleep recommendations. Additionally, those inpatient pediatric nurses with advanced degrees have greater belief that a sleep-related/SIDS event could occur during a work-shift, and greater belief in the AAP infant safe sleep recommendations.

Years in practice. The researcher examined whether there were any associations between the number of years in practice of inpatient pediatric nurses and their knowledge, attitudes, beliefs, and practices of current American Academy of Pediatrics (2016) infant safe sleep recommendations. In order to make the year of practice ranges of the sample more homogeneous in nature, the group of less than 2 years and 2-5 years were merged into the group ranging from

6-10 years for a total n = 86. The groups of 11-15 years and 16-20 years were merged into the group of > 20 years in practice for a total n = 119.

Years in practice and confidence. This variable showed one statistically significant weak positive correlation found between years in practice and confidence towards the practicing of ISS at the p = .05 level ($rs(205) = .134$ (p = .055). An independent-samples t-test was conducted to compare years in practice and confidence for both groups. The results showed a statistically significant difference for those inpatient pediatric nurses in the > 10 years of practice (M = 92.65, SD = 9.82) and those in the ≤ 10 years of practice (M = 87.73, SD = 16.48) with t (203) = -2.67, p = .008. The magnitude of the differences in the means (mean difference = -4.91, 95% CI: -8.55 to -1.28) was small (Cohen's d = .363).

Overall findings of years in practice. Independent-samples t-test was conducted to compare all variables of interest for both groups of years in practice. The overall findings of years in practice and the variables of interest showed one statistically significant finding. The more years of the inpatient pediatric nurse in practice, the greater the confidence scores toward practicing of ISS.

Inpatient pediatric nurses' healthcare professional colleagues. This researcher examined whether there were any associations between inpatient pediatric nurses' colleagues' practices (*normative beliefs* and *subjective norm*) and the variables of interest. There were several statistically significant correlations identified for the sample that responded to these survey items. With n = 146, Table 24 shows the statistically significant correlations for inpatient pediatric nurses' colleagues' practices for the items pertaining to *normative beliefs*. Table 25 shows the correlations for the influence of inpatient pediatric nurses' colleagues' practices with the items for *subjective norm*. The results were as follows.

Associations with inpatient pediatric nurses' colleagues' practices (normative beliefs).

There were statistically significant moderate positive correlations found between inpatient pediatric nurses' colleagues' practices and inpatient pediatric nurses' beliefs in the AAP recommendations ($r(144) = .405$, $p = .000$); inpatient pediatric nurses' self-recognition as a role model of infant sleep practices ($r(144) = .448$, $p = .000$); and inpatient pediatric nurses' attitudes ($r(144) = .397$, $p = .000$). Also noted were statistically significant moderate positive correlations between inpatient pediatric nurses' colleagues' practices and the influence the AAP has on the inpatient pediatric nurses' infant safe sleep practices ($r(144) = .346$, $p = .000$); and belief that a sleep-related/SIDS event could occur during a work-shift ($r(144) = .336$, $p = .000$). Lastly noted were statistically significant moderate positive correlations with inpatient pediatric nurses' colleagues' practices and confidence ($r(144) = .354$, $p = .000$); and inpatient pediatric nurses' colleagues' practices and knowledge ($r(144) = .479$, $p = .000$). Two statistically significant strong positive correlation were noted between inpatient pediatric nurses' colleagues practices and inpatient pediatric nurses' practices ($r(144) = .776$, $p = .000$), and the presence of an ISS initiative/policy on the unit ($rs(144) = .537$, $p = .000$).

Table 25

Statistically Significant Pearson's and Spearman's Correlations for Inpatient Pediatric Nurses' Colleagues' Practices (n = 146)

Variable	*r*	Sig (2-tailed)
Belief in AAP recommendations	.405**	.000
Self-recognition as role model	.448**	.000
Attitudes	.397**	.000
Influence of AAP	.346**	.000
Belief in a work-shift sleep-related/SIDS event	.336**	.000
Confidence	.354**	.000
Knowledge	.479**	.000
Inpatient pediatric nurses' practices	.776**	.000
ISS initiative/policy	.537**†	.000

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.
† Spearman's Rho

Associations with inpatient pediatric nurses' colleagues' practices (subjective norm).

Analyses with the data measuring the influence of inpatient pediatric nurses' colleagues' practices and the variables of interest revealed the following statistically significant correlations (Table 26). There were weak inverse correlations found with influence of inpatient pediatric nurses' colleagues' practices and inpatient pediatric nurses' practices of infant safe sleep ($r(203) = -.164$, $p = .019$), and inpatient pediatric nurses' attitudes ($r(203) = -.138$, $p = .048$). One statistically significant moderate positive correlation found was between the influence of inpatient pediatric nurses' colleagues' practices and the influence of the parents of the infants (parent satisfaction) reported by the participants ($r(203) = .481$, $p = .000$).

Table 26

Statistically Significant Pearson's Correlations for Influence of Inpatient Pediatric Nurses' Colleagues' Practices (n = 205)

Variable	*r*	Sig (2-tailed)
Inpatient pediatric nurses' practices	-.164**	.019
Attitudes	-.138*	.048
Influence of parents	.481**	.000

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.

Overall findings of inpatient pediatric nurses' colleagues. The overall findings of inpatient pediatric nurses' colleagues (*normative beliefs*) showed that the more aligned inpatient pediatric nurses' colleagues' infant sleep practices were with the AAP recommendations, the greater the inpatient pediatric nurses' beliefs in the AAP recommendations, the greater the self-recognition as a role model, the more positive the attitude of inpatient pediatric nurses toward infant safe sleep, and the greater the influence the AAP has on inpatient pediatric nurses. In addition, the findings showed the more aligned the inpatient pediatric nurses' colleagues' infant sleep practices were with the AAP recommendations, the greater inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift, the greater the inpatient pediatric nurses' confidence in practicing infant safe sleep, the greater the infant safe sleep knowledge, and the more inpatient pediatric nurses' infant sleep practices aligned with the AAP recommendations. Additionally noted was the more aligned the in inpatient pediatric nurses' colleagues' infant sleep practices were with the AAP recommendations, the more likely there is an ISS initiative/policy on the unit where participants were employed.

The overall findings of the influence of inpatient pediatric nurses' colleagues' practices (*subjective norm*) showed the lesser the influence inpatient pediatric nurses' colleagues' practices had on inpatient pediatric nurses' practices of infant safe sleep, the greater inpatient

pediatric nurses' infant sleep practices aligned with the AAP recommendations, and the more positive inpatient pediatric nurses' attitudes are toward infant safe sleep. Also found was the greater the influence inpatient pediatric nurses' colleagues' practices had on inpatient pediatric nurses' practices of infant safe sleep, there was a greater influence of parents (parent satisfaction).

Parents' satisfaction. The researcher examined whether there were any associations between inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of AAP infant safe sleep recommendations and parents' satisfaction. The findings of this correlational analysis demonstrated a statistically significant weak inverse correlation noted between parent satisfaction and attitudes ($r(202) = -.147$, $p = .036$), and inpatient pediatric nurses' infant sleep practices ($r(202) = -.250$, $p = .000$).

Overall findings of parents' satisfaction. The overall findings of the influence of parents (parents' satisfaction/*subjective norm*) on inpatient pediatric nurses showed the less influence of parents, the more positive the inpatient pediatric nurses' attitude and the more inpatient pediatric nurses' infant sleep practices aligned with the AAP recommendations.

Additional Findings

In addition to the findings pertaining to the research questions, other statistically significant correlations were noted. Further analysis of the data, conducting Pearson's and Spearman's Correlations, showed statistically significant correlations with numerous variables of interest. The results are as follows.

Knowledge. There were numerous statistically significant correlations identified between knowledge and other variables of interest (Table 27). A statistically significant strong positive correlation was found with knowledge and inpatient pediatric nurses' infant sleep practices

($r(203) = .647$, $p = .000$) and beliefs in the AAP recommendations ($r(203) = .518$, $p = .000$). Moderate positive correlations were demonstrated between knowledge and inpatient pediatric nurses' self-recognition as a role model of infant sleep practices ($r(203) = .449$, $p = .000$); the influence the AAP has on the inpatient pediatric nurses' infant safe sleep practices ($r(203) = .327$, $p = .000$); attitudes ($r(203) = .447$, $p = .000$); inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift ($r(203) = .390$, $p = .000$); inpatient pediatric nurses' colleagues' practices ($r(144) = .479$, $p = .000$); and ISS initiative/policy on the unit ($rs(203) = .370$, $p = .000$). One statistically significant weak positive correlation was noted between knowledge and confidence in practicing infant safe sleep ($r(203) = .229$, $p = .001$).

Table 27

Statistically Significant Pearson's and Spearman's Correlations for Knowledge (n = 205)

Variable	*r*	Sig (2-tailed)
Inpatient pediatric nurses' infant sleep practices	.647**	.000
Belief in AAP recommendations	.518**	.000
Self-recognition as role model	.449**	.000
Influence of AAP	.327**	.000
Inpatient pediatric nurses' attitudes	.447**	.000
Belief in a work-shift sleep-related/SIDS event	.390**	.000
Inpatient pediatric nurses' colleagues' infant sleep practices ($n = 146$)	.479**	.000
ISS initiative/policy	.370**†	.000
Confidence	.229**	.001

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.
† Spearman's Rho

Attitudes. Numerous statistically significant correlations were also found between the inpatient pediatric nurses' attitudes toward infant safe sleep and other variables of interest (Table 28). Moderate positive correlations were demonstrated between attitudes and beliefs in the AAP

recommendations ($r(203) = .469$, $p = .000$); inpatient pediatric nurses' infant sleep practices ($r(203) = .562$, $p = .000$); inpatient pediatric nurses' self-recognition as a role model of infant sleep practices ($r(203) = .482$, $p = .000$), and influence the AAP has on the inpatient pediatric nurses' infant safe sleep practices ($r(203) = .414$, $p = .000$). There were also weak positive correlations noted between attitudes and ISS initiative/policy on the unit ($rs(203) = .162$, $p = 021$); inpatient pediatric nurses' sense of control over infant sleep practices ($r(203) = .171$, $p = .014$); and inpatient pediatric nurses' colleagues' practices ($r(144) = .397$, $p = .000$).

Table 28

Statistically Significant Pearson's and Spearman's Correlations for Attitudes (n = 205)

Variable	*r*	Sig (2-tailed)
Belief in AAP recommendations	.469**	.000
Inpatient pediatric nurses' infant sleep practices	.562**	.000
Self-recognition as role model	.482**	.000
Influence of AAP	.414**	.000
ISS initiative/policy	.162* †	.021
Control	.171**	.014
Inpatient pediatric nurses' colleagues' infant sleep practices ($n = 146$)	.397**	.000

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.
† Spearman's Rho

Inpatient pediatric nurses' infant sleep practices. Numerous statistically significant correlations were also found between the inpatient pediatric nurses' infant sleep practices and other variables of interest (Table 29). Inpatient pediatric nurses' infant sleep practices demonstrated a moderate positive correlation with the influence the AAP had on the inpatient pediatric nurses' infant safe sleep practices ($r(203) = .474$, $p = .000$); and a moderate positive correlation with an ISS initiative/policy on the unit ($rs(203) = .410$, $p = 000$). More statistically

significant moderate positive correlations found with inpatient pediatric nurses' infant sleep practices were with inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift ($r(203) = .430$, $p = .000$); and inpatient pediatric nurses' self-recognition as a role model of infant sleep practices ($r(203) = .572$, $p = .000$). Some statistically significant weak positive correlations were identified with inpatient pediatric nurses' practices and their sense of control over infant sleep practices ($r(203) = .157$, $p = .014$); and with inpatient pediatric nurses' confidence in practicing infant safe sleep ($r(203) = .236$, $p = .001$).

Table 29

Statistically Significant Pearson's and Spearman's Correlations for Inpatient Pediatric Nurses' Practices (n = 205)

Variable	*r*	Sig (2-tailed)
Influence of AAP	.474**	.000
ISS initiative/policy	.410**	.000
Belief in a work-shift sleep-related/SIDS event	.430** †	.000
Self-recognition as role model	.572**	.000
Control	.157**	.014
Confidence	.236**	.001

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.
† Spearman's Rho

Influence of AAP. Other statistically significant correlations noted pertained to influence of the AAP and variables of interest (Table 30). Statistically significant moderate positive correlations were noted between the influence of the AAP and inpatient pediatric nurses' infant sleep practices ($r(203) = .477$, $p = .000$); self-recognition as a role model of infant sleep practices ($r(203) = .309$, $p = .000$); ISS initiative/policy on the unit ($rs(203) = .197$, $p = .005$); and inpatient pediatric nurses' confidence practicing infant safe sleep ($r(203) = .236$, $p = .001$). In addition, statistically significant correlations were found between the influence of the AAP and inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift

($r(203) = .259$, $p = .000$) and inpatient pediatric nurses' colleagues' practices ($r(144) = .346$, $p = .000$).

Table 30

Statistically Significant Pearson's and Spearman's Correlations for Influence of American Academy of Pediatrics (n = 205)

Variable	*r*	Sig (2-tailed)
Inpatient pediatric nurses' infant sleep practices	.477**	.000
Self-recognition as role model	.309**	.000
ISS initiative/policy	.197**†	.005
Confidence	.236**	.001
Belief in a work-shift sleep-related/SIDS event	.259**	.000
Inpatient pediatric nurses' colleagues' infant sleep practices ($n = 146$)	.346**	.000

* Correlation is significant at the $p \leq .05$ level.
** Correlation is significant at the $p \leq .01$ level.
† Spearman's Rho

ISS initiative/policy. Also identified were statistically significant Spearman's correlations between the presence of an ISS initiative/policy on the unit and the variables of interest (Table 31). A statistically significant moderate correlation was identified between the presence of an ISS initiative/policy and inpatient pediatric nurses' colleagues' practices ($rs(144) = .537$, $p = .000$). Other statistically significant moderate positive correlations were found between the presence of an ISS initiative/policy and inpatient pediatric nurses' self-recognition as a role model of infant sleep practices ($rs(203) = .300$, $p = .000$); knowledge ($rs(203) = .370$, $p = .000$); and inpatient pediatric nurses' practices ($rs(203) = .410$, $p = .000$). There were statistically significant weak positive correlations identified between the presence of an ISS initiative/policy and inpatient pediatric nurses' confidence ($rs(203) = .188$, $p = .007$); inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift ($rs(205)$

= .237, p = .001); the influence of the AAP (rs(203) = .197, p = .005); belief in AAP recommendations (rs(205) = .176, p = .012); and attitudes (rs(203) = .162, p = .021).

Table 31

Statistically Significant Spearman's Correlations for ISS Initiative/Policy (n = 205)

Variable	*rs*	Sig (2-tailed)
Inpatient pediatric nurses' colleagues' infant sleep practices	.537**	.000
Self-recognition as role model	.300**	.000
Knowledge	.370**	.000
Inpatient pediatric nurses' infant sleep practices	.410**	.000
Confidence	.188**	.007
Belief in a work-shift sleep-related/SIDS event	.237**	.001
Influence of AAP	.197**	.005
Belief in AAP recommendations	.176**	.012
Attitudes	.162**	.021

*Correlation is significant at the $p \leq .05$ level.
**Correlation is significant at the $p \leq .01$ level.

Other findings. In addition, there were statistically significant correlations found between the inpatient pediatric nurses' sense of control over infant sleep practices scores and inpatient pediatric nurses' confidence in practicing infant safe sleep (r(203) = .463, p = .000); and self-recognition as a role model of infant sleep practices (r(203) = .368, p = .000). Lastly, a statistically significant correlation was found between inpatient pediatric nurses' belief that a sleep-related/SIDS event could occur during a work-shift and inpatient pediatric nurses' self-recognition as a role model of infant sleep practices (r(203) = .406, p = .000).

Qualitative Findings

This study also used qualitative questions that served as a component to gain more depth of explanation and understanding. The findings are presented in order of the questions asked.

The first set of questions were, “What are your honest beliefs regarding infant sleep practices issued by the AAP? What kind of trust do you have in the credibility of AAP’s recommendations? The findings are as follows.

Most participants responded that they had trust in the AAP’s recommendations. Some responses found were, “… believe they are credible. Findings have been replicated in many countries, many cultures”; “Lots of trust”; “The AAP offers valid information based on safe infant sleep practices that is proven by research studies”; “Fully believe that back is best and trust this practice”; and “Even though my parents co-slept with me, my belief is that I was lucky that nothing happened to me as a baby. I trust the AAP’s recommendation completely and will always follow it. This past weekend, I re-educated a mom 16 times over two days about co-sleeping every time I entered the room and she was sleeping with the baby. I educated and put the baby in the crib on its back. I believe it’s the safest way.”

While the overarching expression of trust was noted in the narrative, there were several respondents who had expressed different views. Some participants’ responses spoke to the changes in sleep recommendations made by the AAP over time. Some responses were, “I think that the AAP changes the guidelines often and leave parents confused”; “I guess they make some sense, but they are not always right. They rescind on recommendations”; “…it is interesting how they have changed over time. For instance, I had one nurse share how ‘back to sleep’ was not the standard at one point in time”; “I don't have 100% trust in the AAP's recommendations because they change and because I know many mothers who let their baby sleep on prone all of the time”; and “… have been known to change their recommendations.”

Other participants felt that the hospital setting presented a challenge to implementing the AAP recommendations. Some responses were, “Putting into practice in the hospital setting can

be challenging sometimes"; "In the Healthcare setting it is difficult to practice safe sleep... there is no room to place objects such as diapers, bp cuffs, etc. unlike a house where you can usually separate and place things in different areas and also do not usually have as many items. We also cannot control the temperature environment in the hospital so we do need to cover the infant with blankets to keep them warm. It is very challenging to model safe sleep in a hospital setting. I become a little frustrated sometimes with the back to sleep movement…"; "I think there should also be some judgment as to what may be best while an infant is hospitalized"; and "I believe the AAP's recommendations are credible but are sometimes difficult to emulate in a hospital setting."

The next qualitative question was, "What influence, if any, does parent satisfaction have on your infant sleep practices in the work setting?" The qualitative narratives to this question suggested an overarching dichotomy with the types of responses found by the respondents, suggesting the influence is significant to some or has little to no significance to others. Some responses to illustrate this were, "If we upset parents, our survey results will decline. What is best for patient does not always match what parents believe is safe for baby. Parent satisfaction is a factor for our performance evaluations, so some nurses may not put pressure on the parents to ensure satisfaction"; "In the work setting I have a hard time balancing what I know to be best practice (AAP guidelines) with parent's beliefs or practices from home. I try to educate, but sometimes it feels like I'm not going to convince them otherwise, so I just let them do what they're going to do as long as it's not egregiously unsafe (co-sleeping, prone sleeping, etc.)"; "Significant amount"; "It's an uphill battle. Sometimes, we just have to give in"; and "None. Safety should always be more important than parent satisfaction"; "no influence"; "teach proper technique"; "0"; "None. We do not make exceptions"; and "None. Safety first."

The last qualitative question provided was applicable to those inpatient pediatric nurses who responded yes when asked about parental status. The question was, “If you are a parent, did you follow and implement the AAP infant sleep guidelines with your OWN CHILD during infancy? Why or why not? If not applicable, please put ‘NA’.” The qualitative narratives to this question also suggested an overarching dichotomy with a significant mention of importance of sleep when the AAP recommendations were not followed. Some responses were, “Yes. As a nurse, I always followed the recommendations out of fear. We never co-slept with my infants and they always slept in an empty crib”; “Yes- Currently my newborn sleeps on back, in a bassinet in same room as me. Nothing in bassinet but fitted sheet”; “I 100% followed safe sleep recommendations…”; and “Yes, I truly believe it reduced the risk of SIDS, and I wanted what was best for my baby…” Conversely, others stated “…sometimes my son just wouldn't go back to sleep and my husband and I needed sleep, too”; “I used to practice what would get me sleep”; “As a breastfeeding working mother, my babies nurse every 2 hours through the night, had they not have slept with me I never would’ve slept”; and “no, stress/fatigue did whatever I could to get sleep for myself, husband and the baby.”

Conclusion

The *ISP* tool was used to measure inpatient pediatric nurses’ knowledge, attitudes, beliefs, and infant sleep practices in the pediatric hospital setting. This tool consisted of items that used multiple choice/select, true/false, yes/no, Likert-type style questions, VAS, demographic questions, and qualitative questions with open-text fields to gather the data. The sample consisted of a total $n = 205$, and for most analyses, the total sample was used. Pearson’s correlation, Spearman’s correlation, t-tests, and ANOVA were the statistical methods used to analyze data. The following is an overall summary of the findings from this chapter.

- 74.6% of inpatient pediatric nurses were fully knowledgeable about the infant safe sleep recommendations by the AAP
- 57.1% of inpatient pediatric nurses reported fully positive attitudes regarding infant safe sleep practices
- 78% of inpatient pediatric nurses reported moderately high to full belief in the infant safe sleep recommendations by the AAP
- 67.8% of inpatient pediatric nurses identified their practices of infant safe sleep as most of the time to always being in alignment with the AAP recommendations
- Inpatient pediatric nurses reported that 25.9% of their colleagues' infant safe sleep practices are most of the time to always in alignment with the AAP recommendations (28.8% answered as I don't know)
- 81% of inpatient pediatric nurses moderately to fully self-recognized as role models of infant safe sleep to HCP colleagues and parents
- 56.6% of inpatient pediatric colleagues reported moderate to full belief that a sleep-related/SIDS event could occur during a work-shift
- 72.7% of inpatient pediatric nurses reported moderate to full sense of control over their infant sleep practices
- 91.7% of inpatient pediatric nurses reported moderate to full confidence in their infant sleep practices
- 77.1% of inpatient pediatric nurses reported the presence of an ISS Initiative/Policy on their work unit
- Age demonstrated weak positive correlations to belief in the AAP recommendations, increased influence of the AAP, and higher self-recognition as a role model. There was

increased confidence noted in higher age groups in comparison to the youngest age group. Conversely, the analysis revealed there was a higher level of knowledge for the younger participants

- Parental status showed that participants who were parents had greater self-recognition as a role model, higher confidence, and better aligned AAP recommended infant safe sleep practice
- Participants with advanced academic degrees had greater knowledge of the infant safe sleep recommendations by the AAP, higher belief that a sleep-related/SIDS event could occur during a work-shift, and greater belief in the AAP recommendations
- Participants with more years in practice showed increased confidence
- Identified were positive correlations that showed that with greater inpatient pediatric nurses' knowledge score, the higher inpatient pediatric nurses' practices aligned with AAP recommendations, the greater the beliefs in the AAP recommendations, the more positive the attitudes, the more belief that a sleep-related/SIDS event could occur during a work-shift, the higher the influence the AAP had on the inpatient pediatric nurses practice, and the less influence parent satisfaction had on their practices
- The greater the inpatient pediatric nurses' colleagues' practices aligned with the AAP recommendations, the greater the inpatient pediatric nurses' self-recognized as a role model, the more positive the inpatient pediatric nurses' attitude, the higher the confidence, and the higher the inpatient nurses' practices aligned with the AAP
- The higher the influence of parent satisfaction, noted were the less that inpatient pediatric nurses' practices aligned with the AAP recommendations and the lower the inpatient pediatric nurses' attitude

- Inpatient pediatric nurses had differing levels of trust in the AAP recommendations ranging from full trust to none; they stated that the AAP recommendations changes have led to altered levels of trust; and state that the hospital setting presented a challenge to implementing the AAP recommendations of infant safe sleep
- The influence of parents' satisfaction on inpatient pediatric nurses' infant sleep practices in the work-setting produced results that showed an overarching dichotomy where it had significant influence or little to none
- Some inpatient pediatric nurses reported infant sleep practices with their own infant did align with the recommendations of the AAP, while some inpatient pediatric nurses' infant sleep practices with their own infant did not, particularly when it came to getting sleep

CHAPTER FIVE: DISCUSSION

This chapter presents an organized discussion on the findings of the study, implications, limitations, and recommendations. The overall intent of this study was to examine inpatient pediatric nurses' infant safe sleep knowledge, attitudes, beliefs, and practices in providing care to infants during hospitalization in the acute care setting. This study investigated the existence of relationships among personal and work characteristics, academic degrees, years in practice, and acceptance and belief of the scientific evidence used to establish infant sleep recommendations by the AAP. Using a quantitative, descriptive study with a qualitative component, concurrent quantitative and qualitative data collection was conducted by incorporating open-ended responses with comment boxes into the *ISP* tool used for the study. The rationale for this approach was the qualitative data would add depth to the quantitative findings and thus would provide a more comprehensive understanding of inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of ISS than either approach alone.

Since few studies have been done on this topic or with these variables, pertaining to inpatient pediatric nurses, this research has increased the depth and breadth of understanding inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of ISS. In addition, this design illuminated the various nuances that existed among inpatient pediatric nurses' acceptance and beliefs about the ISS recommendations issued by the AAP.

The Theory of Planned Behavior (TPB; Ajzen, 1985, 1991) provided the theoretical framework for this study. TPB has been used in numerous studies to confirm the relationships among behavioral beliefs, normative beliefs, control beliefs, and intention to perform specified behaviors. TPB provides a conceptual framework for understanding the determinants of human action. This theory was used to explain behaviors with an understanding of how many different

factors influence behaviors. Using TPB as the theoretical lens, the researcher was able to discover the relationships of inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of ISS issued by the AAP.

Personal Characteristics and Demographics

The researcher examined personal characteristics and demographics on a final sample of inpatient pediatric nurses with an $n = 205$. Those elements of personal characteristics and demographics included age, gender, ethnicity, parental status, academic degree, years in practice, and unit most frequently worked. The following sections are summaries of these findings.

Age. The data related to age included an expansive range with some groups too small for analysis. After collection, the age categories were collapsed into four groups. The rationale for selecting four groups was to create homogeneity among the groups and to explore general inferences about age related to the other variables.

Among the most prominent of findings for age was the relationship with age and belief in AAP infant safe sleep recommendations. The results showed an increase in belief with increased age, with the greatest significance noted between the youngest age group of those inpatient pediatric nurses and the oldest age group. This finding indicated that as life experience increases with age, a greater belief in AAP recommendations occurs. The oldest group of nurses have seen and lived through, first-hand, the evolution and impact of the AAP recommendations since their inception in 1992. Those of the youngest age group were either not born at the time of the AAP recommendations inception or were infants themselves and therefore had no real sense or first-hand experience of the evolution or impact of the AAP scientific, evidence-based recommendations.

This study also found there was a relationship between age and inpatient pediatric nurses' confidence in practicing ISS. This finding showed that the more advanced the inpatient pediatric nurse in age, the greater the confidence. A longitudinal psychological study by Orth et al. (2010) found confidence was lowest among young adults but increased throughout adulthood, peaking at age 60, before it started to decline (Orth, Trzesniewski, & Robins, 2010). The findings of the current study, in regard to age and confidence, are consistent with the findings of Orth et al. (2010).

Another finding noted was a relationship with age and greater self-recognition as a role model. A role model is an individual who acts as an exemplar of success that can be attained by someone and provides a template of the behavior that is required to achieve success (Morgenroth, Ryan, & Peters, 2015). As one advances in age, one advances in confidence (Orth et al., 2010). Positive role models have a healthy appreciation of their skills and achievements that serve as confidence (Howe, 2018). The current study found that with advancing age of inpatient pediatric nurses, there was an increase in confidence of their ISS practices, which in turn provides a platform for advanced aged inpatient pediatric nurses to self-recognize as role models for infant sleep practices.

The current study found a statistically significant difference between the age groups and inpatient pediatric nurses' knowledge of, as well as practices of, AAP recommended infant safe sleep. For age and inpatient pediatric nurses' knowledge of infant safe sleep, there was a difference found between the 31-40 years old and the 41-50 years old groups. This was an expected finding by the researcher, as AAP recommendations of infant safe sleep position changed from back and side-lying position to back only in 2000. Those inpatient pediatric nurses aged 41-50 would have learned the prior recommendation as back/side as a parent or in nursing

school, in comparison to those aged 31-40 who may have learned back only as a parent or in nursing school. For age and practices, there was a statistically significant difference between groups > 50 years old and 41-50 years old. The > 50 years old group had higher practice scores. This again may be due to the fact that the oldest group of nurses have seen and lived through, first-hand, the evolution and impact of the AAP recommendations since their inception in 1992. Those of the 41-50 age group had no prior knowledge other than what they learned and therefore may not have been aware of the changes made in 2000.

Gender and race. The sample used in this study indicated the majority of respondents reported as females and as White. With such low representation among the other categories, analysis with respect to gender and race would likely not have been informative. Therefore, descriptive data were reported for informational purposes only and were not used in the analyses.

Parental status. The researcher examined the relationship of parental status to the other variables of interest. The overall findings of parental status indicated that those inpatient pediatric nurses who reported being a parent had greater self-recognition as a role model of infant sleep practices, greater confidence, and showed their infant sleep practices aligned more with the AAP recommendations of infant safe sleep. The qualitative component of this study helped to enrich the findings. Although approximately 15% of inpatient pediatric nurses' narratives reported their practices with their own infants did not align with AAP recommendations, particularly when there was a need for sleep, the majority of respondents' narratives described their sleep practices with their own infants aligned with AAP recommendations of that time.

Another noted finding was a relationship with inpatient pediatric nurses who were parents and the infant sleep practice scores of their colleagues. Those inpatient pediatric nurses, having

demonstrated higher self-recognition as role models scores, may influence their colleagues' practices. Inpatient pediatric nurses who were parents had first-hand experience in rearing their own children and therefore had significant use of sleep practices, outside of their role as an RN. The qualitative data found in the narrative revealed most inpatient pediatric nurses followed the current ISS practices at that time. A study conducted by Kravet et al. (2011) found a statistically significant relationship between being considered clinically excellent and being considered an effective role model. Clinical excellence is considered an attribute to serving as a role model (Kravet et al., 2011). Therefore, these inpatient pediatric nurses who were parents serve as effective role models of infant safe sleep.

Academic degrees. The overall findings of the current study demonstrated that inpatient pediatric nurses who had advanced degrees had greater knowledge of AAP infant safe sleep recommendations. Additionally, those inpatient pediatric nurses with advanced degrees had greater belief that a sleep-related/SIDS event could occur during a work-shift and greater belief in AAP recommendations. Aiken et al. (2003) identified a clear link between higher levels of nursing education and better patient outcomes (Aiken, Clarke, Cheung, Sloane, & Silber, 2003). A study by Djukic et al. (2019) found that baccalaureate prepared nurses reported being significantly better prepared than associate degree nurses on 12 out of 16 areas related to quality and safety, including evidence-based practice, data analysis, and project implementation. The authors concluded that improving accreditation and organizational policies requiring the BSN for RNs could help safeguard the quality of patient care (Djukic, Stimpfel, & Kovner, 2019).

The study conducted by Cho, Sohn, Lee, and Ahn (2020) in Korea found that inpatient mother-baby (MB) and pediatric nurses with advanced education had higher ISS knowledge scores. Consistent with the literature, the findings of the current study showed significant

differences between associate degree-prepared nurses to inpatient pediatric nurses prepared at the baccalaureate, masters, and doctoral level, collectively.

Years in practice. The data related to years in practice included an expansive range of some groups with a small number of respondents. After collection, the years in practice categories were collapsed into two groups, which created greater homogeneity and allowed exploration of general inferences about years in practice related to the other core variables. By separating the respondents into these two groups, the data were able to demonstrate an association between years in practice and confidence. As the inpatient pediatric nurses' experience increases, they become more comfortable in their role because they have seen more and done more and therefore become more confident in their practices.

Knowledge

The researcher examined inpatient pediatric nurses' knowledge of the current AAP (2016) Safe Infant Sleep Recommendations. To gain understanding of their level of knowledge, participants were asked to correctly identify AAP recommendations using six knowledge-based items. A total knowledge score was obtained using a sum score of the items corresponding on the *ISP* tool. The findings in this study showed approximately three-quarters of participants had full knowledge of the AAP recommendations. While other studies have been conducted that are similar in assessing ISS knowledge of nurses, this current study is unique in its population, items, and scores achievable.

In the current study of inpatient pediatric nurses, all participants correctly identified the back (supine) as AAP recommended sleep position with approximately less than 10% identifying an unsafe sleep position. A previous study found in the literature was of nurses working in NICUs, which showed more than three-quarters of respondents were able to identify the AAP's

infant safe sleep recommendation of supine position (Grazel et al., 2010). A quality improvement study by Shadman et al. (2016), which aimed to increase adherence to safe sleep practices for infants admitted to a children's hospital general care unit, found almost all of the nursing staff, which included registered nurses and nursing assistants, had knowledge of the AAP recommended sleep position before the intervention. Another study conducted on CNMs showed that almost all of the respondents correctly identified supine as the infant sleep position recommended by the AAP, with less than 5% identifying both supine and side-lying as AAP recommended (Hodges, 2016; Hodges et al., 2018).

When asked which sleep environments the AAP recommends for routine infant sleep, the current study showed 59% correctly identified at least one safe infant sleep environment without choosing any unsafe options. Hodges (2016) and Hodges et al. (2018) found almost identical results, with 58% who correctly identified at least one without choosing any unsafe options. Forty-one percent of participants from the current study correctly selected all three of the appropriate environments (crib, bassinet or cradle, and portable crib) from the answers provided.

When asked to select safe items to include in an infant's sleep environment, the current study showed that approximately 90% of participants were able to correctly answer the question without choosing any unsafe items. The Hodges (2016) and Hodges et al. (2018) study on CNMs found approximately three-quarters were able to correctly answer the question without choosing any unsafe items (Hodges, 2016; Hodges et al., 2018).

The knowledge item that pertained to the risk reduction of SIDS using a true/false style response in the current study showed 96.6% of participants correctly agreed that the risk of SIDS can be reduced. Hodges (2016) and Hodges et al. (2018) found almost identical results with 96.7% of participants who correctly agreed that the risk of SIDS can be reduced.

The results of the knowledge item that pertained to the likelihood of infants aspirating when placed on their backs to sleep showed approximately 90% of participants correctly responded false to infants being more likely to aspirate when placed on their backs to sleep. Hodges (2016) and Hodges et al. (2018) found similar results with 93.5% of participants who recognized that infants are not more likely to aspirate when placed on their backs to sleep. The Aris et al. (2006) study on NICU nurses showed approximately half of the participants incorrectly cited reflux as the most common reason to place a full-term infant prone. Shadman et al. (2016) found only about one-third of nursing staff had knowledge of aspiration and sleep position.

The final knowledge question pertained to the safety of infants sharing a sleep surface with a parent. The current study found that almost all of the participants correctly identified infants and parents sharing a sleep surface is not safe. Shadman et al. (2016) found that 100% of nursing staff had knowledge of AAP recommendation for infants to not share a sleep surface.

Overall, the participants of the current study of inpatient pediatric nurses had high knowledge scores indicating that this sample was highly knowledgeable of the AAP recommendations of infant safe sleep. The findings of the current study are consistent with those found in the literature. Although a high level of knowledge was noted in the current study, the literature shows that knowledge is not the sole element that translates into practice adherence.

Despite information dissemination, numerous barriers, beyond lack of knowledge or awareness of guidelines, and healthcare providers' (HCP) knowledge acquisition, studies show that knowledge alone has a limited effect on changing behavior (Cabana et al., 1999; McGinty & Anderson, 2008; Melnyk, 2007; Pathman et al., 1996; Pravikoff et al., 2005). The following

sections will discuss this topic as it pertains to inpatient pediatric nurses' practices, AAP recommendations, and adherence.

Inpatient Pediatric Nurses' Practices

The researcher examined infant sleep practices of inpatient pediatric nurses. A total score was obtained using a sum score of the eight practice items self-reported by each respondent. The current study found less than 10% of inpatient pediatric nurses self-reported always using AAP recommendations, and approximately two-thirds self-reported using AAP recommendations most of the time (Appendix F). The Shadman et al. (2016) study on infants admitted to the hospital similarly assessed full adherence through crib audits that found 0% of pre-intervention sleep practices were in complete alignment with AAP recommendations. McMullen et al. (2016) conducted safe sleep observations that showed less than one-third in full alignment. Sleutel et al. (2018), although not reported as an overall practice score, showed 0% of inpatient MB and pediatric nurses to be in complete alignment pre-intervention upon crib audits. Other similar studies found in the literature regarding nurses' infant sleep practices were conducted either on different populations of nurses or provided results on individual practices without providing a sum score, as this study did. The following sections will itemize and discuss the findings for each practice and compare applicable studies found in the literature.

Infant sleep position. The current study showed that approximately two-thirds of inpatient pediatric nurses self-reported they always place infants supine. An interventional study by McMullen et al. (2016) conducted crib audits and found approximately two-thirds were found supine and one-third were found either side-lying or prone. A study by Mason et al. (2013) performed crib audits in a well-baby nursery located in a community teaching hospital in Kansas. The results of the crib audits showed approximately 90% of infants were found in the supine

sleep position. Sleutel et al. (2018) also conducted crib audits and found three-quarters of infants were supine or held at the time of observation pre-intervention. The study by Shadman et al. (2016) on infants admitted to the hospital also performed crib audits that showed approximately three-quarters of infants were found supine. The percentage found in the current study, pertaining to supine position for infant sleep, is consistent with those found in the literature, which clearly indicates that supine position is not implemented consistently in hospitals 100% of the time, as AAP recommended.

Objects, wedges, and positioners in crib. The AAP recommendation pertaining to objects in the sleep environment states that soft objects and loose bedding, such as pillows, quilts, comforters, or sheepskins are to be away from the infant's sleep area, as well as the avoidance of commercial devices, such as wedges and positioners. As an A-level recommendation, the current study and other studies show not all nurses practice this recommendation.

Presence of objects, wedges, and positioners in crib. The current study showed that less than half of inpatient pediatric nurses self-reported they never use a loose blanket; approximately one third never place loose objects in the crib; and approximately one third never use rolls, towels, or another form to prop/position the infant. The crib audit findings from the study by Sleutel et al. (2018) found less than half of cribs free from soft objects at the time of observation pre-intervention. The study by Shadman et al. (2016) on infants admitted to the hospital performed crib audits that showed less than 5% of cribs were free from items at the time of observation. The crib audits in the study by Mason et al. (2013) found more than three-quarters had an unsafe sleep environment, with one or more items in the crib. Although not numerically quantified, the McMullen et al. (2016) interventional study noted multiple items such as pillows,

diapers, wipes, and dressing supplies were found in the cribs before and immediately after the educational intervention. The percentages found in the current study pertaining to objects in the crib for infant sleep are consistent with those found in the literature, illustrating hospitalized infants are not always free from soft or loose objects in their sleep environment, as this AAP recommendation to have no loose and/or soft objects in the sleep environment is not always followed.

Removal of objects, wedges, and positioners from crib. The researcher examined inpatient pediatric nurses' practices of removing loose and/or soft objects from the crib and educating parents about safe sleep. The findings showed that less than half of inpatient pediatric nurses self-reported always removing loose and/or soft objects from the crib and educating parents about safe sleep. The only study noted to ascertain this information is the study by Sleutel et al. (2018) in which the sample of inpatient MB and pediatric nurses self-reported removing loose soft objects in the crib and educating parents about safe sleep as a very important factor of infant safe sleep.

Breastfeeding. This researcher examined inpatient pediatric nurses' practices in relation to supporting and/or encouraging breastfeeding as an AAP recommendation. Breastfeeding of the infant is an A-level AAP recommendation. Breastfeeding is associated with a reduced risk of SIDS, and unless contraindicated, mothers should exclusively breastfeed or feed with expressed milk (i.e., not offer any formula or other nonhuman milk-based supplements) for the first 6 months of life (AAP, 2016). Although the protective effect of breastfeeding increases with exclusivity, any breastfeeding has been shown to be more protective against SIDS than none (AAP, 2016). The findings of the current study showed approximately two-thirds of inpatient pediatric nurses self-reported always following this practice.

Spatz (2011) stated that the lack of breastfeeding in the United States is considered to be a public health crisis. The World Health Organization, AAP, and numerous other professional organizations all recommend that infants be exclusively breastfed for the first 6 months of life. However, only 13.6% of infants in the US receive exclusive human milk during this time period (Spatz, 2011). A Joint Commission Exclusive perinatal core measure is exclusive breastfeeding (PC-05), but more than 19% of newborns in the United States receive formula supplementation before hospital discharge (Grassley, Clark, & Schleis, 2015; The Joint Commission, 2014; Spatz, 2011).

Studies found in the literature are not specific to reporting the practices of nurses encouraging/supporting breastfeeding in the inpatient pediatric setting, particularly in reference to AAP recommendations to reduce SIDS and other sleep-related infant deaths. Those found pertained more to MB units and immediate post-partum infant needs. Although not reporting on the same type of sample as the current study, one study showed that there is a difference in knowledge, practices, and beliefs in Baby-Friendly/Baby-Friendly Hospital Initiative (BF/BFHI) hospitals compared to non-BF/BFHI hospitals, with MB nurses at non-BF/BFHI referring to breast milk and formula as equal, and even though these nurses considered breastfeeding the "gold standard," they allowed frequent supplementation with formula, regardless of medical need (Wedding et al., 2011). Another study conducted on 302 MB nurses found that approximately three-quarters assisted with breastfeeding techniques and two-thirds counseled patients on infant feeding methods and assisted with lactation problems (Alakaam et al., 2018). The Sleutel et al. (2018) study showed the sample of inpatient MB and pediatric nurses' beliefs in breastfeeding as important for safe sleep mean score pre-intervention was high. The current study is unique in that it studied inpatient pediatric nurses' practice of encouraging/supporting

breastfeeding pertaining to AAP recommendations to reduce SIDS and other sleep-related infant deaths.

Sleep surface sharing. This researcher examined inpatient pediatric nurses' practices of returning an infant to the crib when found sleeping with an asleep parent sharing a sleep surface. The findings of the current study found that approximately half of inpatient pediatric nurses self-reported that when finding an infant sharing a sleep surface with an asleep parent, they address the situation and educate on infant safe sleep and move the baby to the crib. According to AAP recommendations, the safest place for an infant to sleep is on a separate sleep surface designed for infants, as this arrangement is most likely to prevent suffocation, strangulation, and entrapment that may occur when the infant is sleeping in an adult bed (AAP, 2016). The practice of sharing a sleep surface or bed sharing is common in many cultures and facilitates breastfeeding, which is known to be a protective factor against SIDS (Hauck et al., 2011). Yet, it was noted in case-control studies that bed sharing has been associated with an increased risk of SIDS and is believed that soft bedding, soft mattresses, the risk of overheating, and the risk of overlay contribute to this increased risk (Moon & Hauck, 2018). A secondary data analysis by Schnitzer, Covington, and Dykstra (2012) found that approximately three-quarters of infants whose deaths were classified as sleep-related sudden unexpected infant deaths (SUIDs) were sharing a sleep surface and almost half of these infants were sleeping with an adult. Another secondary data analysis conducted by Erck-Lambert et al. (2019) found overlay deaths occurred most often in an adult bed and infants were overlaid by the mother approximately half of the time. The Sleutel et al. (2018) study found 100% of the sample of MB and pediatric nurses self-reported correcting parents co-sleeping with their infant by educating them and moving the baby to a crib, yet the crib audit data found infants co-sleeping (bed-sharing) with a parent or adult

approximately one-third of the time, pre-intervention. Therefore, based on these studies found in the literature and the findings of the current study, the practice of sharing a sleep surface is not corrected 100% of the time on inpatient pediatric units.

Overdressed infants. The researcher examined inpatient pediatric nurses' practices of re-dressing overdressed infants and educating parents on infant safe sleep. The current study found less than half of inpatient pediatric nurses self-reported always following the practice of redressing overdressed infants and explaining infant safe sleep to parents. An A-level AAP recommendation is to avoid overheating and head covering in infants, as infants should be dressed appropriately for the environment, with no greater than one layer more than an adult would wear to be comfortable in that environment. Parents and caregivers should evaluate the infant for signs of overheating and overbundling, and covering of the face and head should be avoided (AAP, 2016).

Sleutel et al. (2018) showed a majority of inpatient MB and pediatric nurses' beliefs in the amount of clothes the infant is wearing as important for safe sleep. Yet, in that same study, inpatient MB and pediatric nurses self-reported not always redressing overdressed infants and explaining safe sleep environments to parents. The findings of the current study are consistent with that in the literature in which this practice is not always followed.

Overall inpatient pediatric nurses' infant sleep practices. This researcher examined inpatient pediatric nurses' infant sleep practices to ascertain if their practices were aligned with current American Academy of Pediatrics (2016) infant safe sleep recommendations. The results showed that less than 10% of inpatient pediatric nurses achieved a perfect score indicative of full adherence of their practices to AAP recommendations, and less than two-thirds reported their practices were in alignment most of the time. These findings show that greater than 90% of

inpatient pediatric nurses self-reported a lack of *full* adherence to AAP recommendations. The qualitative findings of the current study revealed that some participants indicated AAP recommendations were challenging to implement in the hospital setting. Additionally, this study showed that only half of inpatient pediatric nurses were correcting unsafe behaviors of parents and educating them on infant safe sleep behaviors. A study by Basora et al. (2017) conducted on caregivers of hospitalized infants found most caregivers reported that hospital nursing staff provided no education about infant safe sleep.

Although the literature contains studies conducted on different populations, particularly MB nurses, with a small number conducted on inpatient pediatric nurses, overall, these studies consistently show AAP recommendations are not always being practiced in the hospital setting and parent teaching is not always provided. The findings of the current study are consistent with those found in the literature that show AAP recommendations are not always followed in inpatient pediatric settings, correcting of parental behavior of unsafe sleep, and parent teaching is not consistently provided.

Inpatient Pediatric Nurses' Colleagues' Practices

The researcher examined the infant sleep practices of inpatient pediatric nurses' colleagues, as reported by inpatient pediatric nurses. The findings, as reported by inpatient pediatric nurses, showed that less than 5% of colleagues' practices of infant safe sleep are always in alignment with AAP recommendations, and approximately one-quarter are in alignment with AAP recommendations most of the time. According to the TPB, important referents serve as *normative beliefs*, which ultimately can impact an individual's behavior (TPB; Ajzen, 1985, 1991). In the current study, inpatient pediatric nurses' colleagues' practices of infant safe sleep served as *normative beliefs*, with the infant sleep practices of inpatient pediatric nurses' serving

as the behavior. No other study in the literature has found this variable examined, making this line of inquiry unique and thus adding to the body of knowledge on this topic.

Inpatient pediatric nurses' colleagues' practices of infant safe sleep, as reported by inpatient pediatric nurses, consistently showed less alignment than inpatient pediatric nurses per individual practice studied by item (Figure 10), as well as overall less AAP alignment than inpatient pediatric nurses' infant sleep practices as noted by the total sum scores (Appendix G). Additionally, strong associations were identified between inpatient pediatric nurses' colleagues' and inpatient pediatric nurses' practices. This finding is significant because, based on the TPB, inpatient pediatric nurses' colleagues' practices may have a direct impact on the infant sleep practices of inpatient pediatric nurses. This finding, here again, shows that AAP recommended infant safe sleep practices are not being strictly followed at all times in inpatient pediatric settings and colleagues' practices could have a direct impact on practices overall.

AAP Recommendations, Inpatient Pediatric Nurses' and Colleagues' Practices, and Adherence

The literature shows that advances in evidence-based practice have improved patient health outcomes (Stevens, 2013). Evidence-based practice is intended to standardize healthcare practices to the most current and best science available to create clinical practice guidelines and recommendations to promote high-quality practices, minimize practice variations, and avoid unanticipated health outcomes. Guidelines and recommendations are systematically developed statements issued to assist the HCP and patient decisions about appropriate healthcare for specific clinical situations (Institute of Medicine, 1990). The AAP uses scientific, evidence-based practice to establish and update infant sleep recommendations every five years.

Although evidence-based practice is widely recognized in reducing morbidity, mortality, medical errors, and the variation of healthcare delivery, the literature shows it is not always followed nor implemented consistently by nurses and other clinicians in healthcare systems (Gigli et al., 2020; Lenzer, 2013; Melnyk, 2007; Melnyk et al., 2012). Barriers to implementation consist of knowledge deficit such as lack of awareness or lack of familiarity; attitudes such as lack of agreement, lack of self-efficacy, lack of outcome expectancy, differing social-cultural context, or the inertia of previous practice; and external barriers to the behavior such as its difficulty in use, cumbersomeness or its cause of confusion (Baiardini et al., 2009; Cabana et al., 1999).

The findings of the current study are similar to the others found in the literature in which the current sample had a high level of knowledge of AAP recommendation, yet practices are not consistently followed 100% of the time. The study by McMullen et al. (2016) showed the observation component of the study had inconsistency between nursing knowledge and practice. While data showed nurses knew the supine position was the safest position, the observation component continued to find infants being placed in other positions by nurses. The Sleutel et al. (2018) study found the sample of inpatient MB and pediatric nurses had a high level of knowledge of AAP safe sleep recommendations, yet the practices were not consistently aligned with the AAP recommendations.

Attitudes

The researcher examined inpatient pediatric nurses' attitude toward practices of ISS. Sum scores were obtained to measure their attitudes. The results showed approximately one-half of inpatient pediatric nurses had a fully positive attitude toward practicing ISS. One's attitude toward a behavior is defined as one's personal evaluation of that behavior and is based on the

positive and negative outcomes expected to be associated with it (Ajzen, 1985, 1991). The TPB posits that the probability of engaging in a given behavior is determined by the intention to engage in the behavior which itself is a function of one's attitude (Zemore & Ajzen, 2014). Based on TPB and its application to the current study, half of inpatient pediatric nurses did not self-report a fully positive attitude toward infant safe sleep practices and therefore may be contributing to their lack of full adherence to AAP recommendations in their practices of infant sleep.

Beliefs

The researcher examined numerous variables pertaining to beliefs of inpatient pediatric nurses. These included inpatient pediatric nurses' belief in AAP recommendations on infant safe sleep, important referents' influence on their infant sleep practices, level of self-recognition as a role model of infant sleep practices to parents and to colleagues, and belief that a sleep-related/SIDS event could occur during a work-shift on their unit.

TPB explains behaviors with an understanding of how many different factors influence behaviors. The researcher's Model of Theory of Planned Behavior Applied to the Study of Inpatient Pediatric Nurses and Infant Sleep Practices was guided by the principles and constructs of the TPB. According to the model, inpatient pediatric nurses' ISS beliefs and their attitude toward ISS served as *behavioral beliefs* and *attitude toward the behavior*. The perceived normative expectations of important referents which included the AAP, inpatient pediatric nurses' colleagues (based on their infant sleep practices), and parents (dependent on satisfaction rating) served as *normative beliefs.* Inpatient pediatric nurses' belief and infant sleep practices, in relation to the influence of the AAP, colleagues (based on their infant sleep practices), and parents (dependent on satisfaction rating) served as the *subjective norm*. The presence of an ISS

unit initiative/policy served as *control belief*, and the level of confidence and control of the inpatient pediatric nurses performing ISS practices served as the *perceived behavioral control*. The following sections discuss the findings for each of their beliefs.

Belief in AAP recommendations. The findings of the current study showed that approximately three-quarters of inpatient pediatric nurses had moderate to full belief in AAP recommendations. Sleutel et al. (2018) showed inpatient MB and pediatric nurses, overall, had a high level of belief in AAP recommendations. The qualitative findings of the study support the findings of the quantitative data analyses, as a majority of respondents' narratives showed that there was full belief in the AAP recommendations. However, some did report a lack of trust, as AAP recommendations have changed over time and felt these changes made them less credible, thus altering their level of belief.

Influence of AAP, colleagues, and parents on inpatient pediatric nurses. The researcher examined the amount of influence (*subjective norm*) the AAP, colleagues' practices, and parents had on inpatient pediatric nurses' infant sleep practices. The current study showed that the AAP had significant influence on infant sleep practices with over 95% who reported moderate to absolute influence. Although this is a positive finding, the influence of their colleagues' practices and the influence of the infants' parents weighed significantly on inpatient pediatric nurses' practices as well. The results showed almost three-quarters of inpatient pediatric nurses reported moderate to absolute influence by their colleagues' practices. Almost two-thirds reported moderate to absolute influence by the parents. The qualitative findings of this study showed that parent satisfaction can be a significant factor on inpatient pediatric nurses' infant sleep practices. The qualitative data revealed a dichotomy with approximately half of the participants' narratives describing how parent satisfaction had moderate to significant influence

over their infant sleep practices. In addition to these findings, there were statistically significant inverse correlations identified between inpatient pediatric nurses' colleagues' practices and those of the inpatient pediatric nurse, and between parents' influence and satisfaction and inpatient pediatric nurses' practices.

Based on the findings of the scores of inpatient pediatric nurses' belief in AAP recommendations and the influence the AAP has on their practice scores, as well as the associations identified between belief, influence of AAP and inpatient pediatric nurses' practices, the researcher's Model of Theory of Planned Behavior Applied to the Study of Inpatient Pediatric Nurses and Infant Sleep Practices appears credible. Greater belief scores and greater influence of the AAP on inpatient pediatric nurses' practices demonstrated higher infant safe sleep practice scores in inpatient pediatric nurses. Furthermore, the findings of colleagues' practice scores (*normative belief*), and colleagues' and parents/parents' satisfaction influence scores and qualitative findings (*subjective norm*) with the demonstrated inverse correlations noted pertaining to these variables, showed that those inpatient pediatric nurses who had higher influence of colleagues' practice scores and higher influence of parents/parents' satisfaction scores, had lower infant safe sleep practices scores. This finding indicated that the greater the influence of other important referents were over AAP recommendations to inpatient pediatric nurses, the lower inpatient pediatric nurses' practices scores were, which signified less aligned infant sleep practices to AAP recommendations.

Self-recognition as a role model. The researcher measured inpatient pediatric nurses' level of self-recognition as a role model of infant sleep practices to parents, and to colleagues, using two VAS. These scores were combined to obtain a total score to determine the respondents' total level of self-recognition as a role model. The results showed only about one-

quarter of the participants totally self-recognized and approximately half of the participants moderately self-recognized as a role model.

The literature shows that although parents may be aware of basic ISS recommendations, studies find they are often uncertain about what recommendations look like or mean in practice (Moon et al., 2010). Unfortunately, data indicate that healthcare providers often model unsafe practices or simply fail to discuss safe sleep (Ajao et al., 2011; Eisenberg et al., 2015; Goodstein et al., 2015; Hauck et al., 2003; Mason et al., 2013; Shadman et al., 2016; Smith et al., 2010). These failures to model infant safe sleep practices can both further confuse parents and implicitly suggest that unsafe practices are acceptable.

Studies of nurses show that they do not see it as their role to teach ISS to parents/caregivers (Basora et al., 2017; Rowe et al., 2016). In the current study, less than half reported providing routine education to caregivers about infant safe sleep. Ongoing parent education throughout the infant's hospitalization is essential to promote safe sleep practices in the home environment in a supportive manner. This can occur through both verbal, teaching sessions, and non-verbal methods, such as through role modeling.

Modeling of best ISS practices by all nurses is critical to increasing adherence to ISS recommendations (Gelfer et al., 2013). Several studies have shown that nurses role modeling best ISS practices is a crucial component to educating not only parents but also other nurses, therefore creating a perpetuating effect of ISS behaviors overall. Sleep practices observed in the hospital environment are more likely to be followed and repeated by all involved in the infant's care (Gelfer et al., 2013).

Fowler et al. (2013) shared that practices by nurses in the nursery were one of the most important factors in parents' determination of safe sleep practices. Use of extra blankets,

elevation of the head of the crib, and the use of other supplies to position the infant is often seen in the hospital (Rowe et al., 2016). However, these practices can be imitated by the infant's parent after discharge and pose a risk to the infant's sleep environment. Sleutel et al. (2018) showed that inpatient MB and pediatric nurses self-reported high importance for role modeling of infant safe sleep practices by nurses in the hospital setting, yet their infant sleep practices were not fully in alignment with AAP recommendations. The findings of this study add to the literature, as self-recognition as a role model of ISS practices to colleagues and parents has never been quantified before and therefore adds to the body of knowledge on this topic.

Belief in sleep-related/SIDS death occurring during work-shift. The researcher examined the level of belief inpatient pediatric nurses had that a sleep-related/SIDS event could occur during a work-shift. The results showed less than half of inpatient pediatric nurses had full belief that it could occur. No other studies in the literature have been noted to examine this; therefore, the finding of this study is unique and thus adds to the literature.

ISS initiative/policy. The researcher examined the presence of an ISS initiative/policy (*control beliefs*) reported by inpatient pediatric nurses and sought to determine if its presence or absence had any impact on inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices. According to TPB, control beliefs recognize factors that may either enhance or impede an individual's performance of a behavior (Ajzen, 1985, 1991). The results of the current study showed that approximately three-quarters of respondents answered yes to an ISS initiative/policy being in place. There were multiple statistically significant associations found with the presence of an ISS initiative/policy. The most noteworthy were between its presence and inpatient pediatric nurses' practices, colleagues' practices, knowledge, self-recognition as a role model, and belief that a sleep-related/SIDS event could occur during a work-shift.

Studies found in the literature show that the presence of an ISS initiative/policy improves nurses' infant safe sleep knowledge and practices (Heitmann et al., 2017; Leong et al., 2019; Walcott et al., 2018). The current study is consistent with other studies found in the literature, showing that increased knowledge and increased adherence to AAP recommendations occurred with the presence of an ISS initiative/policy. What the current study adds to the body of knowledge are the associations identified between increased self-recognition as a role model, increased belief that a sleep-related/SIDS event could occur during a work-shift, and increased alignment of colleagues' practices with AAP recommendations in inpatient pediatric nurses. All of these, which according to the researchers Model of Theory of Planned Behavior Applied to Study of Inpatient Pediatric Nurses and Infant Sleep Practices posits, positively influence all inpatient pediatric nurses' infant safe sleep practices.

Qualitative Findings

The findings of the qualitative data served as a component to gain more depth of explanation and understanding. The questions asked of inpatient pediatric nurses were focused in nature, looking to explore their beliefs and practices pertaining to AAP recommendations, parent satisfaction, and practices used with their own infants, if they were parents. The following sections address each topic.

Belief and trust in the credibility of AAP recommendations. A majority of inpatient pediatric nurses' narratives expressed belief and trust in the credibility of AAP recommendations of infant safe sleep. While the overarching expression of belief and trust were noted in the narratives, there were several respondents who had voiced different views. Some participants' responses spoke to the changes in sleep recommendations made by the AAP over time. Due to these guideline changes, the respondents expressed how this negatively impacted their level of

trust. This finding suggests a lack of awareness and understanding that, as scientific research is conducted with evidence-based findings noted, recommendations are updated to reflect best practices based on the research and therefore recommendations would change as a result.

An unexpected finding was how inpatient pediatric nurses described it as challenging to implement ISS in the hospital setting. Several respondents spoke of the nature of the hospital setting, and in particular the bedside, and how it was unable to accommodate frequently used equipment, leaving it to be placed in the infant's sleep environment. One respondent articulated the differences of being at home versus in the hospital setting as "…there is no room to place objects such as diapers, bp cuffs, etc. unlike a house where you can usually separate and place things in different areas..."

Parent satisfaction. The findings of the qualitative data pertaining to parent satisfaction revealed an overarching dichotomy by the types of responses found with the respondents, suggesting the influence is significant to some or has little to no significance to others. The narratives describing significant influence illustrated and further supported how parent satisfaction impacts inpatient pediatric nurses' practices of ISS. Some respondents voiced how poor scores directly affects performance evaluations. One respondent stated, "If we upset parents, our survey results will decline. What is best for patient does not always match what parents believe is safe for baby. Parent satisfaction is a factor for our performance evaluations, so some nurses may not put pressure on the parents to ensure satisfaction." This finding suggests that infant safe sleep practices may be compromised to ensure high parent satisfaction scores, which in turn puts infants at risk.

Infant sleep practices as a parent. Inpatient pediatric nurses who identified as parents were queried about their infant sleep practices with their own child during infancy. A majority of

respondents answered that their practices were aligned with AAP recommendations current at that time. Those respondents whose practices differed did so due to exhaustion and because of their need for sleep.

Implications of Findings

How findings derived from evidence-based research are translated and operationalized into effective nursing practices and policies substantially impact health outcomes, improvement of health care systems, and the performance of healthcare providers (Stevens, 2013). This study uncovered numerous noteworthy findings to be realized to improve infant safe sleep practices. The results provided much insight into inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices of infant safe sleep. From these findings, several implications can be made.

Nursing education. The results of this study showed that inpatient pediatric nurses with advanced degrees demonstrated higher scores in belief in AAP recommendations, infant safe sleep knowledge, and belief that a sleep-related/SIDS event could occur during a work-shift. The literature shows that improved patient outcomes are achieved when nurses are prepared with advanced degrees (Aiken et al., 2003; Djukic et al., 2019).

With advanced degrees, greater belief in AAP recommendations and greater infant safe sleep knowledge were found. These associations translate into safer sleep practices that are more aligned with AAP recommendations. This, in turn, perpetuates a ripple effect, as role-modeling practices are more aligned with AAP recommendations, promotion of improved safe sleep practices in colleagues, and in parents may been seen.

The findings of the CDC WONDER secondary data analysis conducted in April 2020 showed that infant deaths (ICD-10 codes of R95, R99, and W75, used to code COD of SUID), which occurred in *medical facility-inpatient*, had increased from the analysis conducted in the

previous year. Inpatient pediatric nurses with higher academic preparation demonstrated greater belief that a sleep-related/SIDS event could occur during a work-shift. The belief that something of this magnitude is possible may yield greater alignment to infant safe sleep practices, as this study showed a moderate correlation between the two variables. Although correlation does not imply causation, a statistically significant moderate positive correlation was noted between the two variables indicating that as belief in a sleep-related/SIDS event could occur during a work-shift increases, so does alignment to infant safe sleep practices of both inpatient pediatric nurses and colleagues, alike, as there was a statistically significant moderate positive correlation between those two variables as well.

Nursing practice.

Role modeling. An A-level recommendation of the AAP is that healthcare providers, staff in newborn nurseries and NICUs, and child care providers should endorse and model the SIDS risk-reduction recommendations from birth. The literature shows that although parents may be aware of basic ISS recommendations, studies show that they are often uncertain about what recommendations mean and what they look like in practice (Moon et al., 2010). In addition, studies show that role modeling is one of the most significant influencers on parents' sleep practices at home with their infants as well as to their colleagues. This perpetual cycle will further promote greater aligned AAP recommended infant sleep practices and therefore may have an impact on reducing the incidence of SUID overall.

The results of the current study showed approximately one-quarter of the participants totally self-recognized and approximately half of the participants moderately self-recognized as a role model. The findings of this current study suggest that inpatient pediatric nurses need to increase their self-recognition as role models, as their practices have a widespread impact on

infant sleep practices of others. Through advanced education and professional development, nurses need to learn and recognize their behaviors are observed and modeled at the institutional level and beyond the institution where they work.

ISS initiative/policy. This study demonstrated the benefits of an ISS initiative/policy in positively impacting inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices, as well as colleagues' practices of infant safe sleep. In addition, the findings of the current study showed a relationship with ISS initiative/policy and increased inpatient pediatric nurses' level of confidence, level of belief that a sleep-related/SIDS event could occur during a work-shift, level of self-recognition as a role model, and the influence of the AAP on their practices.

The findings of the current study showed that a majority of respondents reported the presence of an ISS initiative/policy on their unit with the analyses demonstrating the benefits of having one. Although a high number of units were reported by the respondents as having an ISS initiative/policy, inconsistencies in policy integration continue to exist on a national level, as evidenced by the numbers reported. Although the literature suggests there is movement toward improved implementation, the findings also indicate there is more work that needs to be done before ISS initiatives/policies are fully integrated into all hospitals in which infants are served.

ISS nurse ambassador. Although the results of the study reveal inpatient pediatric nurses have a high level of knowledge, less than 10% self-reported full adherence to the AAP recommendations of infant safe sleep. It is clear that education, professional development, and reinforcement of ISS are needed to maintain the high standard where full compliance to AAP recommendations is the goal. In order to provide continuing education and provide reinforcement, perhaps ISS Nurse Ambassadors could be identified at all institutions where infants care cared for to support all staff members to remain diligent and reeducate when

practices are suboptimal. It is crucial that all staff approaching the bedside deliver and maintain a consistent message to the family about infant safe sleep.

Parent teaching. Educating patients and families is fundamentally the most important role of the nurse (Marshall et al., 2016). Quality discharge teaching and planning have emerged as a priority for improving patient outcomes as well as reducing costs of care (Weiss et al., 2017). Although termed as *discharge teaching* in preparation for release from the hospital setting, this education is initiated from the time of admission and continues throughout the hospital stay, up to and including the actual time of patient discharge. While discharge teaching is a multidisciplinary effort, nursing staff primarily have this responsibility. Continued teaching and reinforcement, including the correction of parent behaviors that are deemed unsafe, are priorities and must always be implemented.

Furthermore, teaching should not only be limited to the parents and families of the infants but also to colleagues who may have practices that are not aligned with AAP recommendations. Nursing is a discipline of caring and encompasses a culture of leadership, no matter what the location or level of the nurse's job description may be. It is within the nurse's scope of practice to educate on health prevention and health promotion, including colleagues who may engage in behaviors that are contrary to what is beneficial.

Structural intervention. An unexpected finding identified in the qualitative data was that some inpatient pediatric nurses described it as challenging to implement ISS in the hospital setting, particularly due to the lack of space to place frequently used equipment. One recommendation to address this concern would be a structural intervention. Structural change has "an immediate and direct effect on all levels of department, group, and individual activity…therefore…may correct a behavioral problem" (Aplin, 1978, p. 409). Development of

an apparatus (i.e., container or cubby) that could be fastened to the outside of the infant's sleep environment would be easily accessible to the inpatient pediatric nurse, allowing for storage of equipment when not in use. Therefore, having this structural intervention may eliminate these items from ending up in the infant's sleep environment.

Limitations

There are several limitations to the current study. One limitation is that the study population was from a national pediatric nurses' association. This sample population, because they are all members of a specialty organization that promotes pediatric health and wellness, and nursing education on the pediatric population, they may be more inclined to participate in professional development and stay up-to-date on current practices. Thus, this population of inpatient pediatric nurses may not be reflective of non-SPN members in terms of their level of knowledge, attitudes, beliefs, and practices of infant safe sleep.

In addition, as the responses were anonymous with no identifiers of the respondents, their geographical location was unknown. Therefore, it is difficult to say if this sample population is truly representative of all 50 states. Hence, the findings of this study may not be transferrable to all hospital settings across the United States.

Race was not used in any of the analyses due to the inadequate representation found in the returned surveys. This underrepresentation of other racial and ethnic groups that work as inpatient pediatric nurses may have impacted the findings of this study, as over 90% of the participants self-reported as White. Therefore, this sample may not be representative of the total population of inpatient pediatric nurses.

Lastly, a limitation of this study is that all data were obtained through self-reporting. As this method was used to collect the data, response bias may have occurred. Response bias (also

called survey bias) is the tendency of a person to answer questions untruthfully or misleadingly on a survey. In essence, they may feel pressured to give answers that are socially acceptable and may want to portray themselves in the best light (Glen, 2021). Thus, response bias may have affected survey responses.

Recommendations for Future Research

There were interesting findings with all variables of interest. One avenue to pursue for future research could stem from secondary data analysis. One plan the researcher is considering is to conduct multiple regressions, as they are specifically designed to create regressions on models with a single dependent variable (ISS practices) with multiple independent variables (knowledge; attitudes; beliefs; colleagues' practices; ISS initiative/policy; and influence of AAP, colleagues, and parents). Using this method of analysis may shed light on predictors of ISS practices of inpatient pediatric nurses and therefore add to the literature.

Additionally, the current study had rich qualitative data that provided an additional layer to the study, allowing for deeper insight into inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices. As this was a survey-based research study, the qualitative data were limited to the specific questions asked of the participants. Although participants responded to these questions, the responses were more focused in nature due to the specificity of the questions, as they were not fully open-ended. Therefore, inpatient pediatric nurses' written responses may not have been completely descriptive and therefore may not have expressed all of their experiences accurately. Future research on this topic may include a phenomenological study using focus groups to explore the lived experience of inpatient pediatric nurses and their infant sleep practices in the hospital setting. This line of research would add to the literature and allow

for deeper exploration of inpatient pediatric nurses' lived experience of their infant sleep practices in hospital settings.

Due to the inadequate representation of other ethnic and racial backgrounds of the returned surveys, another line of future research may seek out inpatient pediatric nurses of diverse ethnic backgrounds. SUID rates for American Indian/Alaska Native and non-Hispanic Black infants are more than twice those of non-Hispanic White infants, according to the most recent data (CDC, 2020b). In order to gain further understanding, as cultural beliefs and practices may serve as contributing factors to infant sleep practices in the hospital setting, particularly of those from high-risk ethnic populations, a future study with more racial diversity may prove valuable.

Conclusion

With the richness of both the qualitative and quantitative data obtained from this study, the results demonstrated that, although highly knowledgeable on AAP recommendations of infant safe sleep, there are other factors and influences that weigh on inpatient pediatric nurses' practices. Numerous statistically significant relationships were found in this study, suggesting that improvement in some variables may improve other variables. Thus, increases of AAP recommended practices may improve overall.

Hospitals serve as important venues for educating parents on infant safe sleep and the dangers of unsafe sleep environments. Inpatient pediatric nurses' knowledge, attitudes, beliefs, and practices directly impact the safety of infants' sleep environment in the hospital and beyond. This study demonstrates that full integration of an ISS initiative/policy in all hospitals can result in a decrease in the number of infants in unsafe sleep environments, not only in hospitals but also in their home environments. Recognizing that parents are likely to imitate practices that are role

modeled and taught by inpatient pediatric nurses in hospital settings, improvements in inpatient pediatric nurses' practice and parent education would be expected to lead to a reduction of inpatient and household unsafe sleep practices, decreased sleep-related infant deaths, and ultimately decreased infant mortality overall.

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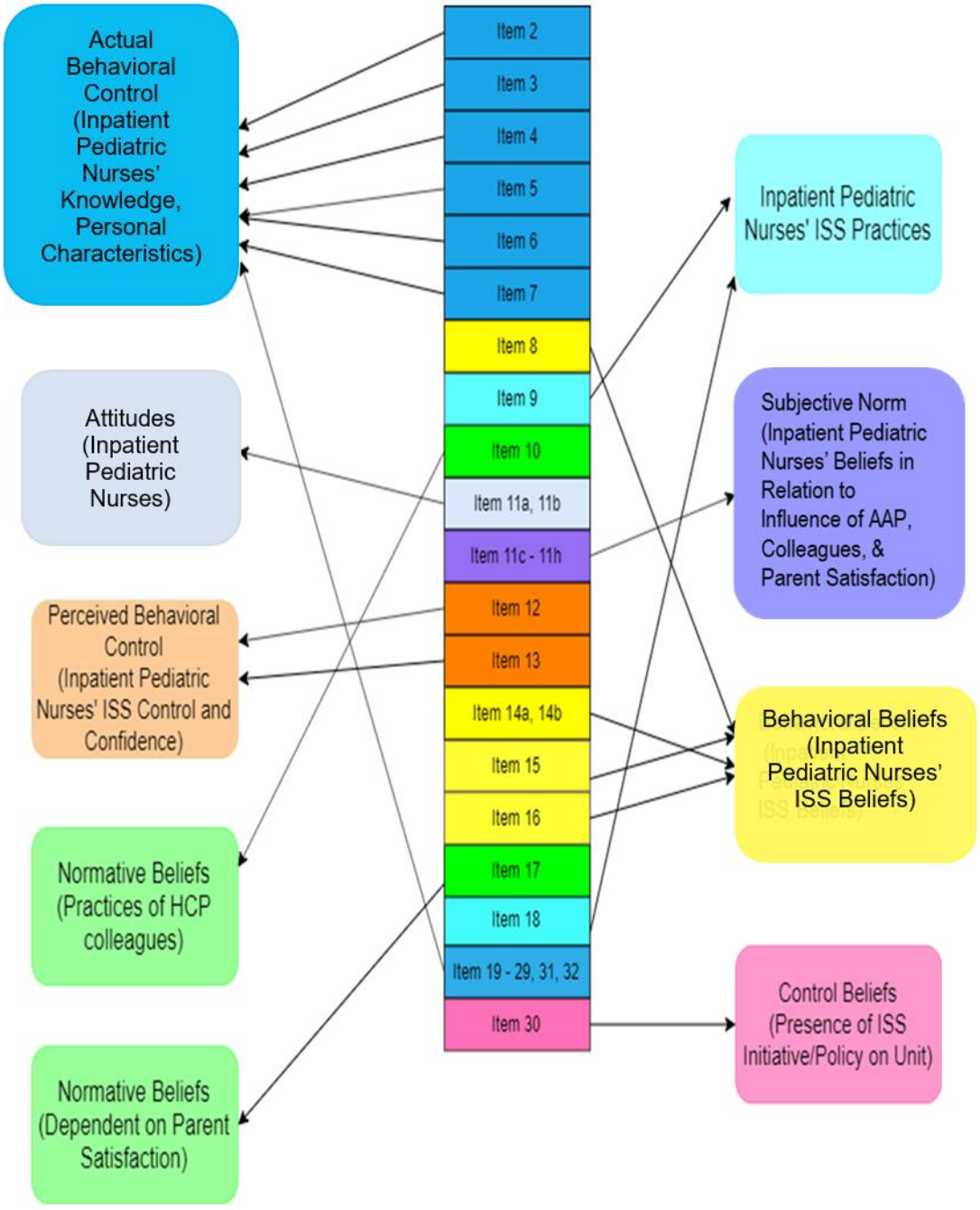
Appendix A

Infant Sleep Practices (*ISP*) Tool: Constructs with Corresponding Items



Appendix B

Infant Sleep Practices Tool

Infant Sleep Practices

1 Thank you for following the link to this survey, which will take approximately 5 - 10 minutes to complete. You are invited to participate in a research study. Taking part in this study is voluntary.
THE PURPOSE OF THIS STUDY IS TO COLLECT BASELINE DATA REGARDING INFANT SLEEP PRACTICES.
An infant is defined as a newborn baby, up to 12 months of age. Your responses are entirely voluntary, and you may stop at any time. This survey is designed to be anonymous, therefore there is no way to connect your responses back to you. Please do not sign your name to the survey or include any information that makes you identifiable.
As a way to express gratitude for your participation in completing the survey, there will be a random drawing for a $250 Amazon eGift Card. In order to be eligible, you must complete the survey. Upon completion of the survey, you will be directed to a Google Form, separate from this survey, where you can type your email address to be entered into the raffle. Your entered email address collected will be completely separate from your survey responses so there will be no way of pairing your survey responses to your email address. Prizes will be awarded in December of 2020.
THANK YOU FOR YOUR TIME
I affirm that I am at least 18 years old and I give my consent for the use of my answers in this study.

- ○ I agree
- ○ I decline

If = I decline Skip To: End of Survey Please answer the following questions based on your KNOWLEDGE of infant safe sleep practices.

2 Based on the current infant sleep recommendations from the American Academy of Pediatrics (AAP), which of the following is considered the safest sleep position for most infants? (Mark all that apply)

- [ ] **On their back (supine)**
- [ ] On their side
- [ ] On their belly (prone)
- [ ] I don't know

*** Boldface signifies correct answer**

3 Based on the current infant sleep recommendations from the AAP, which of the following environments are recommended for infant sleep? (Mark all that apply)

- [ ] Armchair or recliner
- [ ] **Bassinet or cradle**
- [ ] Car seat
- [ ] Couch or sofa
- [ ] **Crib**
- [ ] Infant Swing
- [ ] Parent's bed
- [ ] **Portable crib/play-yard**

*** Boldface signifies correct answers**

4 Based on the current recommendations of the AAP, which of the following items are acceptable to include in an infant's sleep environment? (Mark all that apply)

- [ ] **Fitted crib sheet**
- [ ] Sleep positioning device (i.e., wedge, rolls)
- [ ] Bumpers
- [ ] Loose blanket or quilt

- [ ] **Wearable blanket (i.e., blanket sleeper)**
- [ ] **Pacifier**
- [ ] Pillow
- [ ] Stuffed animal or soft toy
- [ ] I don't know

*** Boldface signifies correct answers**

5 The risk of Sudden Unexpected Infant Death (SUID), such as Sudden Infant Death Syndrome (SIDS) can be reduced.

- ○ **True**
- ○ False

6 Infants are more likely to aspirate when placed on their back to sleep.

- ○ True
- ○ **False**

7 It is safe for a parent and infant to share a sleep surface.

- ○ True
- ○ **False**

*** Boldface signifies correct answers**

Page Break

8 Please answer the following based on your BELIEFS about infant sleep practices in your role as a healthcare professional.
In your opinion, how important do you REALLY feel these factors are for infant safe sleep?

	Not at all important	Minimally important	Somewhat important	Moderately important	Very important
Infant's sleep position as supine (back) position	○	○	○	○	○
Infant's sleep environment (i.e., firm surface, no pillows/blankets, no toys)	○	○	○	○	○
Infant sharing a sleep surface (i.e., bed-sharing, chair-sharing)	○	○	○	○	○
Breastfeeding	○	○	○	○	○
Amount/layers of clothes infant is wearing while sleeping	○	○	○	○	○
Offering the infant a pacifier at nap or bedtime	○	○	○	○	○
Nurses role modeling safe infant sleep practices in the hospital	○	○	○	○	○

Page Break

9 Please answer the following items based on your CURRENT PRACTICES in your role as a healthcare professional. When caring for infants under one year of age, how often.....

	Never	Sometimes	About half the time	Most of the time	Always
Do I place infants to sleep on their back only	○	○	○	○	○
Do I place a loose blanket (non-swaddled placement) on the infant	○	○	○	○	○
Do I place loose objects (blood pressure cuff, diapers, wipes, pulse oximeter probe, infant toys, etc.) in the crib	○	○	○	○	○
Do I use rolls, towels or another form of equipment to prop/position the infant in the crib for sleep	○	○	○	○	○
Do I support and/or encourage breastfeeding	○	○	○	○	○
Do I, when finding an infant sharing a sleep surface with a parent, address the situation and educate on infant safe sleep and move the baby to a crib	○	○	○	○	○
Do I, when finding an overdressed infant, educate on infant safe sleep environments to parents	○	○	○	○	○
Do I remove loose and/or soft objects from the crib and educate parents about safe sleep	○	○	○	○	○

10 Please answer the following items based on the current practices of YOUR COLLEAGUES as healthcare professionals. When caring for infants under one year of age, how often.....

	Never	Sometimes	About half the time	Most of the time	Always	I don't know
Do my colleagues place infants to sleep on their back only	○	○	○	○	○	○
Do my colleagues place loose objects (blood pressure cuff, diapers, wipes, pulse oximeter probe, infant toys, etc.) in the crib	○	○	○	○	○	○
Do my colleagues use rolls, towels or another form of equipment to prop/position the infant in the crib for sleep	○	○	○	○	○	○
Do my colleagues place a loose blanket (non-swaddled placement) on the infant	○	○	○	○	○	○
Do my colleagues support and/or encourage breastfeeding	○	○	○	○	○	○
Do my colleagues, when finding an infant sharing a sleep surface with a parent, address the situation and educate on infant safe sleep and move the baby to a crib	○	○	○	○	○	○
Do my colleagues re-dress overdressed infants and educate on infant safe sleep environments to parents	○	○	○	○	○	○
Do my colleagues remove loose and/or soft objects from the crib and educate parents about safe sleep	○	○	○	○	○	○

11 Please answer the following items based on your ATTITUDE and DECISION about infant sleep practices in your role as a healthcare professional. When caring for infants, ...

	Not at all	Minimally	Somewhat	Moderately	Absolutely
I feel it's necessary to practice infant safe sleep	○	○	○	○	○
I feel it's satisfying to practice infant safe sleep	○	○	○	○	○
I feel the AAP influences my infant sleep practices	○	○	○	○	○
I feel my colleagues influence my infant sleep practices	○	○	○	○	○
I feel my patient's parents' satisfaction influence my infant sleep practices	○	○	○	○	○
I feel my infant sleep practices differ from the AAP, but I practice what I feel is best for the infant	○	○	○	○	○
I feel my infant sleep practices differ from my colleagues, but I practice what I feel is best for the infant	○	○	○	○	○
I feel my infant sleep practices differ from my patient's parents, but I practice what I feel is best for the infant	○	○	○	○	○

12 Using the below slider indicating your LEVEL OF CONTROL based on the statement:
I have complete control over performing infant sleep practices in my role as a healthcare professional.
0 = No control and 100 = Full control

	0 10 20 30 40 50 60 70 80 90 100
Control over practices of infant sleep	

13 Using the below slider indicating your LEVEL OF CONFIDENCE based on the statement:
I am confident that I can practice safe infant sleep in my role as a healthcare professional.
0 = Not at all confident and 100 = Very confident

	0 10 20 30 40 50 60 70 80 90 100
Confidence in practices of infant safe sleep	

14 Using the below slider, please indicate your LEVEL OF SELF-RECOGNITION as a role model based on the following statement:
I see myself as a role model of infant sleep practices…...
0 = Never self-identify as a role model and 100 = Always self-identify as a role model

	0 10 20 30 40 50 60 70 80 90 100
TO PARENTS Self-recognition as role model	
TO COLLEAUGES Self-recognition as role model	

15 Using the below slider indicating your LEVEL OF BELIEF based on the statement:
I believe that a sleep-related death or SIDS event could happen during a work-shift.
0 = Not at all and 100 = Absolutely

	0 10 20 30 40 50 60 70 80 90 100
Belief that a sleep-related death or SIDS event could happen at work	

Using your own words, please answer the following questions, basing your answers on your own BELIEFS or PRACTICES.

16 What are your honest beliefs regarding infant sleep practices issued by the AAP? What kind of trust do you have in the credibility of AAP's recommendations? _____

_____

17 What influence, if any, does parent satisfaction have on your infant sleep practices in the work setting?

_____

_____

18 If you are parent, did you follow and implement the AAP infant sleep guidelines with your OWN CHILD during infancy? Why or why not? If not applicable, please put "NA"

_____

_____

19 My age is

- ○ Less than 25 years old
- ○ 25-30
- ○ 31-40
- ○ 41-50
- ○ 51-60
- ○ 61-65
- ○ Greater than 65 years old

20 My gender is

- ○ Male
- ○ Female
- ○ Other

21 My race is

- ○ Asian/Pacific Islander
- ○ Black
- ○ Hispanic
- ○ White
- ○ Other _____

22 I am licensed and work as a

- ○ Registered Professional Nurse (RN)
- ○ Clinical Nurse Specialist (CNS)
- ○ Nurse Practitioner (NP)
- ○ Certified Nurse Midwife (CNM)
- ○ Other _____

23 I have been working in this role for

- ○ Less than 2 years
- ○ 2-5 years
- ○ 6-10 years
- ○ 11-15 years
- ○ 16-20 years
- ○ More than 20 years

24 My current degree status is (Select All That Apply)

- ☐ Associate's degree
- ☐ In progress of obtaining a Bachelor's degree
- ☐ Bachelor's degree
- ☐ In progress of obtaining a Master's degree
- ☐ Master's degree
- ☐ In progress of obtaining a Doctoral degree
- ☐ Doctorate

25 My focus/area of practice is pediatrics

- ○ Yes
- ○ No

26 I work in a hospital setting

- ○ Yes
- ○ No

27 In my practice, I work with infants (defined as newborn through 365 days old)

- ○ Yes
- ○ No

29 The unit I mostly work on is

- ○ NICU
- ○ Nursery
- ○ Pediatrics
- ○ PICU
- ○ Other _____

30 The unit I mostly work on has an infant safe sleep initiative/policy.

- ○ Yes

- ○ No
- ○ I don't know

31 I am a parent

- ○ Yes
- ○ No

32 THANK YOU FOR YOUR TIME AND RESPONSES

- ○ Done

Skip To: End of Survey = Done - Google Form Raffle Entry https://docs.google.com/forms/d/e/1FAIpQLSdaTxsgboqil8vhr7rhUNuZ1P1VqfoE5KGtIOxQdeY9__yGsA/

End of Block: Default Question Block

Appendix C

Permission to Use Peds Safe Sleep Questionnaire by Sleutel et al (2018)

From: Sleutel, Martha
Sent: Thursday, April 4, 2019 9:07 PM
To: Francine Bono-Neri
Cc: Victoria Siegel
Subject: RE: Permission for use of Tool

Hello, Francine,

You absolutely have permission to use the tool. There were different versions for the different units so I will attach them. Not all questions were relevant to all units and sometimes needed a change of wording to reflect unit differences. You may want to have the nurses fill out their names, whereas we had them create a code. The article reports the psychometrics of the tool.

Good luck with your dissertation!

Martha R. Sleutel, PhD, RN, CNS, C-EFM | Nurse Scientist
T 817.960.6384 (THAM) | 940.898.7119 (THDN) | M 325.374.2598
MarthaSleutel@TexasHealth.org

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From: Francine Bono-Neri [mailto:fbono-neri@molloy.edu]
Sent: Thursday, April 04, 2019 6:48 PM
To: Sleutel, Martha <MarthaSleutel@texashealth.org>
Cc: Victoria Siegel
Subject: Permission for use of Tool

Sent Externally From: fbono-neri@molloy.edu

Warm greetings to you, Dr. Sleutel.

My name is Francine Bono-Neri. I am a Pediatric Nurse Practitioner and Adjunct Faculty member for The Barbara H. Hagan School of Nursing at Molloy College in Rockville Centre, New York. In addition, I am a PhD candidate who will be entering dissertation seminar in the Fall semester of this year. My research topic is Infant Safe Sleep, SUID and SIDS. As I am actively engaged in my lit review, I found your article titled *Response to a National Issue: Moving Beyond "Back to Sleep" at Three Hospitals* (2018). I read that you created a Likert-type questionnaire with items derived from the 2016 AAP's recommendations for safe sleep with a focus to assess RN knowledge/beliefs and practices. I am looking to use the tool specifically created and customized for the pediatric RN, as this is the population I am looking to study. Would you kindly consider granting me permission to use this tool as a key instrument in my dissertation? In addition, I would need the tool itself, as well as all psychometrics run for reliability purposes.

I would be honored if granted permission and would happily acknowledge you, as well as the other creators of the tool, in my dissertation. Have it be known, that I have cc'd my Proposal Seminar professor on this electronic correspondence. Thank you so very much for considering -

Sincerely,
Francine

Molloy College

Appendix D

Permission to use Nurse Survey Instrument by Hodges (2015)

From: Michaels, Nichole
Sent: Thursday, January 2, 2020 9:19 AM
To: Francine Bono-Neri
Subject: Re: Infant Safe Sleep Survey

Thank you for reaching out. Yes, I would be happy to allow you to use a modified version of my infant safe sleep survey tool. I have attached a pdf of the instrument we used for the certified nurse midwives study.

Wishing you all the best on your dissertation.

Kind regards,

Nichole

Nichole (Hodges) Michaels, PhD
Senior Research Scientist
Center for Injury Research and Policy
Abigail Wexner Research Institute
Nationwide Children's Hospital
Nichole.Michaels@NationwideChildrens.org
(614) 355-5870
http://www.injurycenter.org/

From: Francine Bono-Neri <fbono-neri@molloy.edu>
Sent: Thursday, January 2, 2020 7:24 AM
To: Michaels, Nichole
Subject: Infant Safe Sleep Survey

[WARNING: External Email - Use Caution]

Warm greetings to you, Dr. Hodges.

First and foremost, best wishes for a happy, healthy and prosperous new year –

My name is Francine. I am a PhD candidate at Molloy College with a dissertation topic of Infant Safe Sleep (ISS). The reason for my correspondence is to kindly request a modified use of your Infant Safe Sleep tool from your 2016 study. For my dissertation, I am using a convergent parallel research design, obtaining both quantitative and qualitative data, to ascertain ISS knowledge, beliefs, attitudes, and practices of registered professional nurses. I have 2 other tools that I will be modifying to use in my study and am kindly requesting that I use your tool, as well. Would you grant me permission to use a modified version of this tool? Thanks so much for considering.

With kind regards,

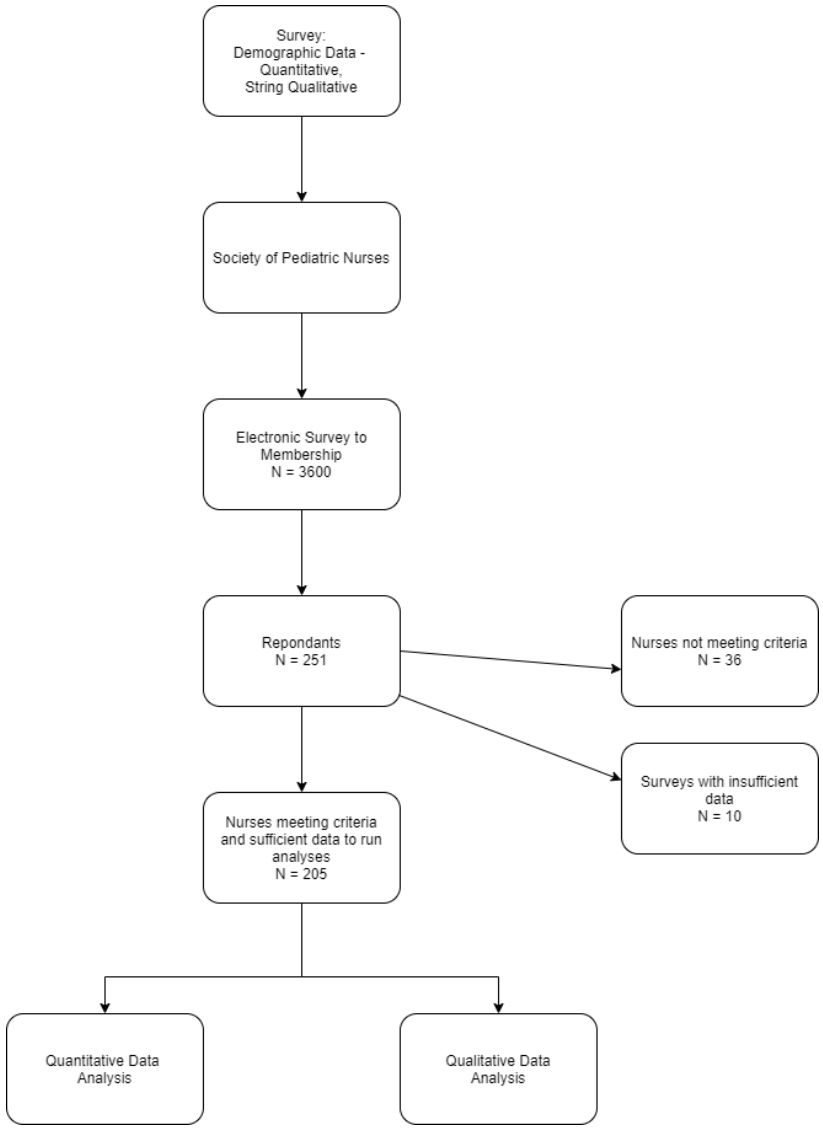
Francine

Francine Bono-Neri, MA, RN, PNP

Molloy College

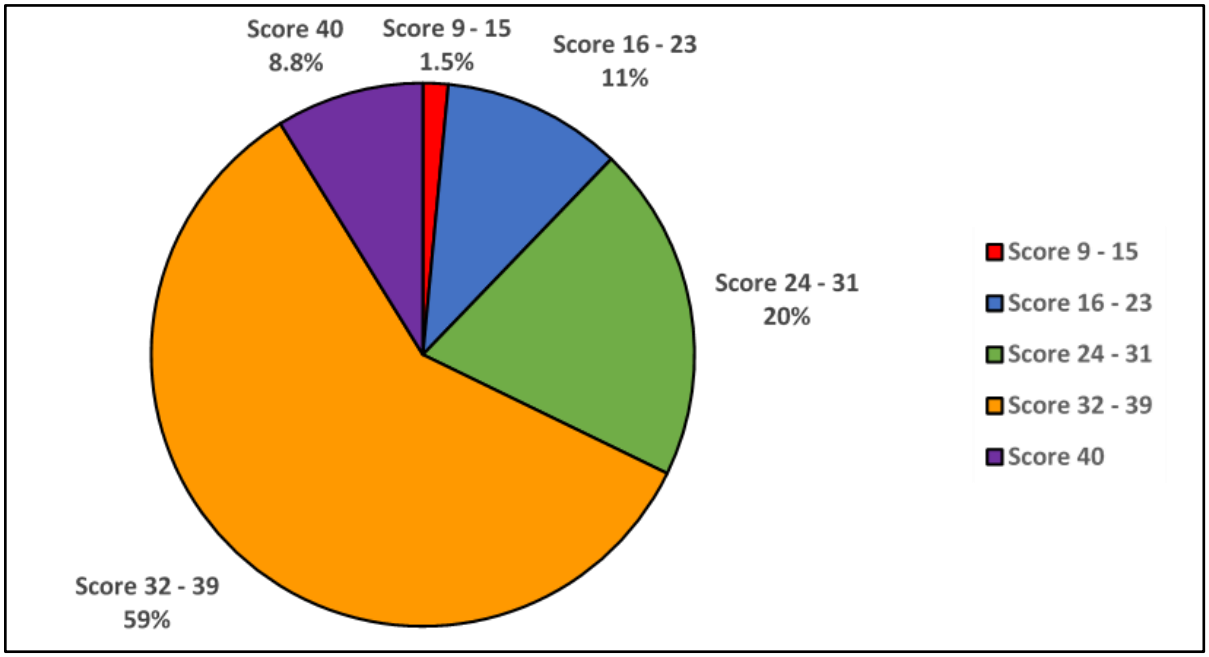
Appendix E

Flowchart of Data Collection for Final Sample



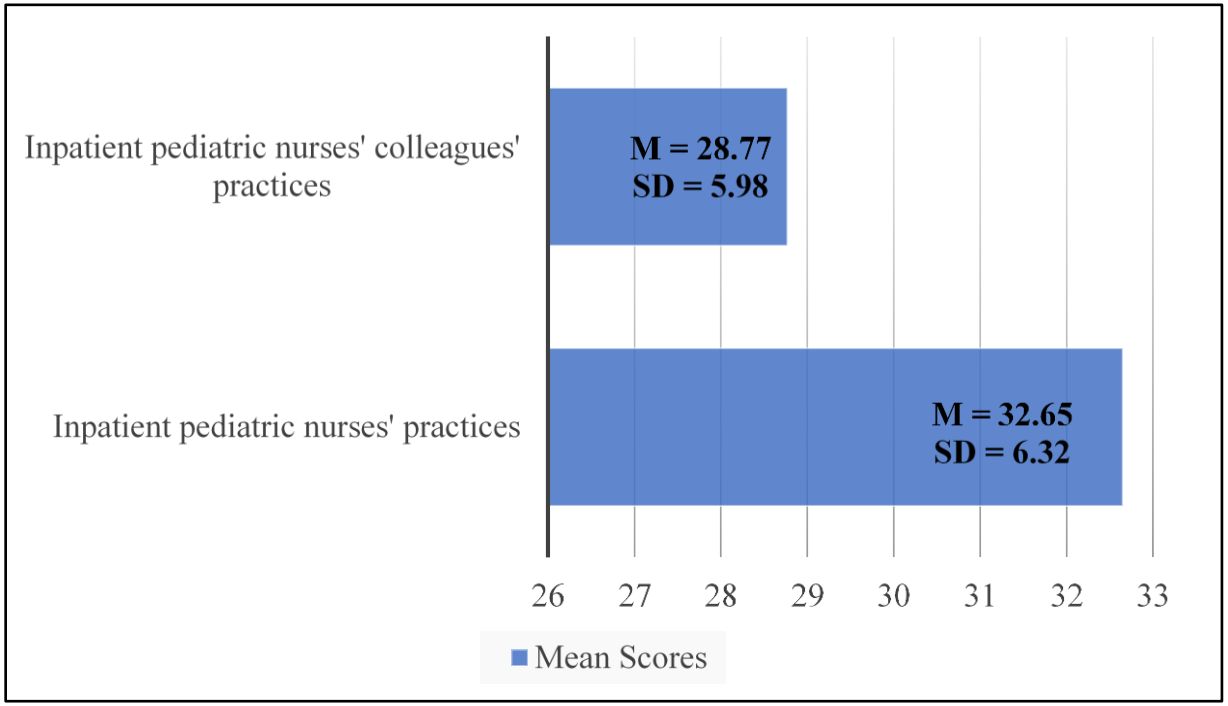
Appendix F

Inpatient Pediatric Nurses' Infant Sleep Practice Scores



Appendix G

Comparison of Mean Scores: Inpatient Pediatric Nurses' Practices to Inpatient Pediatric Nurses' Colleagues' Practice Scores



Appendix H

Institutional Review Board Approval

Molloy College

DATE: July 9, 2020

TO: Francine Bono-Neri, MA, RN, PNP
FROM: Molloy College IRB

PROJECT TITLE: [1604260-1] Inpatient Pediatric Nurses' Knowledge, Attitudes, Beliefs, and Practices of Infant Safe Sleep
REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: July 9, 2020

REVIEW CATEGORY: Exemption category # *2*

Thank you for your submission of New Project materials for this project. The Molloy College IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations. However, exempt research activities are subject to the same human subject protections and ethical standards as outlined in the Belmont Report.

This acknowledgement expires within three years- unless there is a change to the protocol.

Though this protocol does not require annual IRB review, the IRB requires an annual report of your exempt protocol (Expedited and Exempt Research Protocol Annual Report Form) which is available on the IRB webpage.

If there is a proposed change to the protocol, it is the responsibility of the Principal Investigator to inform the Molloy College IRB of any requested changes before implementation. A change in the research may change the project from EXEMPT status and requires prior communication with the IRB.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Patricia Eckardt at 516-323-3711 or peckardt@molloy.edu. Please include your project title and reference number in all correspondence with this committee.

Sincerely,

Patricia Eckardt, Ph.D., RN, FAAN
Chair, Molloy College Institutional Review Board